TOSHIBA

FILE NO. A02-013

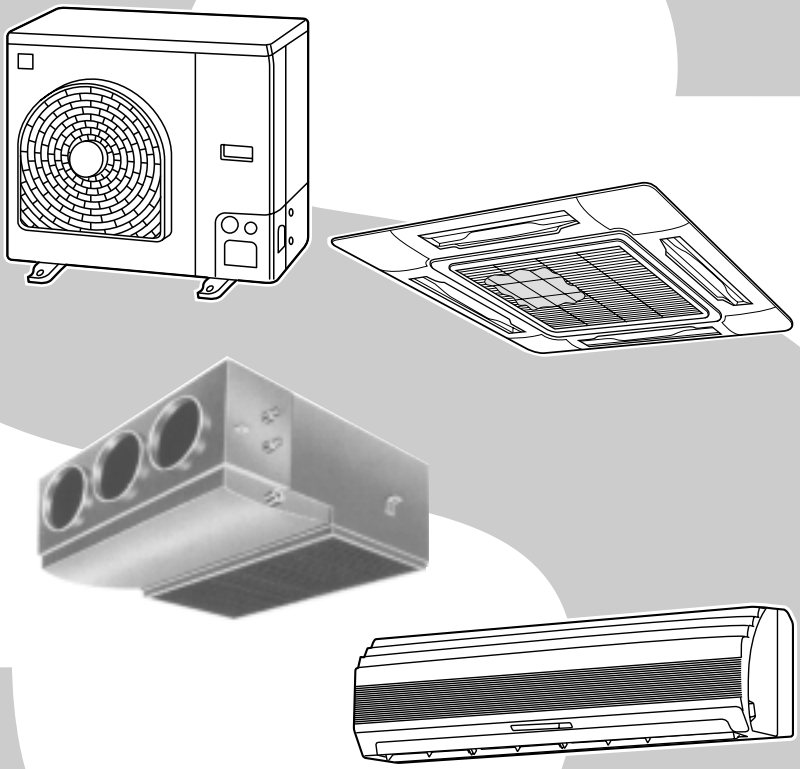
# SERVICE MANUAL

<OWNER'S MANUAL/INSTALLATION MANUAL>

# AIR-CONDITIONER

## SPLIT TYPE

***RAV-SM560AT-E/RAV-SM800AT-E***
***RAV-SM560UT-E/RAV-SM800UT-E***
***RAV-SM560BT-E/RAV-SM800BT-E***
***RAV-SM560KRT-E/RAV-SM800KRT-E***



HFC
R410A

PRINTED IN JAPAN, May., 2003 ToMo

## ADOPTION OF NEW REFRIGERANT

This Air Conditioner is a new type which adopts a new refrigerant HFC (R410A) instead of the conventional refrigerant R22 in order to prevent destruction of the ozone layer.

## WARNING

Cleaning of the air filter and other parts of the air filter involves dangerous work in high places, so be sure to have a service person do it. Do not attempt it yourself. The cleaning diagram for the air filter is there for the service person, and not for the customer.

# 4-Way Air Discharge Cassette Type

## OWNER'S MANUAL


ACCESSORIES (SOLD SEPARATELY) ..... 15
PRECAUTIONS FOR SAFETY ..... 15
PARTS NAME ..... 17
PARTS NAME OF REMOTE CONTROLLER ..... 18
CORRECT USAGE ..... 20
AUTOMATIC OPERATION (Auto Changeover) ..... 21
ADJUSTMENT OF WIND DIRECTIONd ..... 22
TIMER OPERATION ..... 23
MAINTENANCE ..... 25
AIR CONDITIONER OPERATIONS AND PERFORMANCE .... 27
RE-INSTALLATION ..... 28
TROUBLES AND CAUSES ..... 28


# Concealed Duct Type

## OWNER'S MANUAL


ACCESSORIES (SOLD SEPARATELY) ..... 48
PRECAUTIONS FOR SAFETY ..... 48
PARTS NAME ..... 50
PARTS NAME OF REMOTE CONTROLLER ..... 51
CORRECT USAGE ..... 53
AUTOMATIC OPERATION (Auto Changeover) ..... 54
TIMER OPERATION ..... 55
MAINTENANCE ..... 57
AIR CONDITIONER OPERATIONS AND PERFORMANCE . 58
RE-INSTALLATION ..... 59
TROUBLES AND CAUSES ..... 59
TROUBLES AND CAUSES (Concerning Remote Controller) ..... 61


# High-Wall Type

## OWNER'S MANUAL


ACCESSORIES ..... 79
PRECAUTIONS FOR SAFETY ..... 79
PARTS NAME ..... 81
NAME AND FUNCTIONS OF INDICATORS AND CONTROLS ..... 81
NAME AND OPERATIONS OF INDICATORS AND CONTROLS ..... 82
CORRECT USAGE ..... 84
DRY OPERATION ..... 85
AUTOMATIC OPERATION (Auto Changeover) ..... 85
ADJUSTING AIR FLOW DIRECTION ..... 86
HOW THE AIR CONDITIONER WORKS ..... 86
TEMPORARY OPERATION ..... 87
MAINTENANCE ..... 87
AIR CONDITIONER OPERATIONS AND PERFORMANCE . 89
PROBLEMS AND CAUSES ..... 90


# Accessories

## OWNER'S MANUAL


REMOTE CONTROLLER FOR AIR CONDITIONER (SPLIT TYPE)
<Wireless Type> TCB-AX21U (W)-E ..... 108

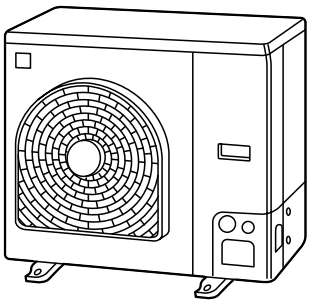
WEEKLY TIMER FOR AIR CONDITIONER (SPLIT TYPE)
<Program Weekly Timer Type> RBC-EXW21E ..... 116

REMOTE CONTROLLER FOR AIR CONDITIONER
<Simple Operation Type> RBC-AS21E ..... 122

# Outdoor Unit ––––––––– RAV-SM560AT-E/RAV-SM800AT-E

## INSTALLATION MANUAL

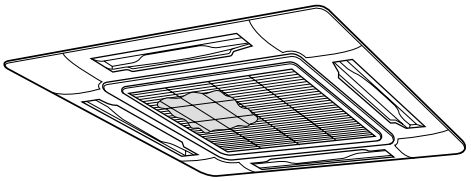

PRECAUTIONS FOR SAFETY ..... 1
ACCESSORY AND REFRIGERANT ..... 3
SELECTION OF INSTALLATION ..... 3
REFRIGERANT PIPING ..... 8
EVACUATING ..... 10
ELECTRICAL WORK ..... 12
FINAL INSTALLATION CHECKS ..... 13

# RAV-SM560UT-E/RAV-SM800UT-E

## INSTALLATION MANUAL

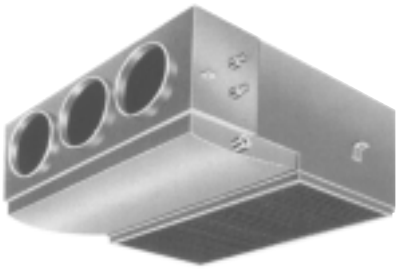

Accessory parts and Parts to be procured locally ..... 29
PRECAUTIONS FOR SAFETY ..... 30
SELECTION OF INSTALLATION PLACE ..... 32
DRAIN PIPING WORK ..... 37
REFRIGERANT PIPING ..... 39
EVACUATING ..... 40
ELECTRICAL WORK ..... 42
TEST RUN ..... 45
TROUBLESHOOTING ..... 46
MAINTENANCE ..... 47

# RAV-SM560BT-E/RAV-SM800BT-E

## INSTALLATION MANUAL

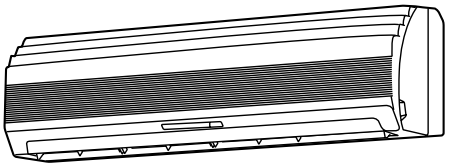

Accessory parts and Parts to be procured locally ..... 62
PRECAUTIONS FOR SAFETY ..... 63
SELECTION OF INSTALLATION PLACE ..... 65
INSTALLATION OF INDOOR UNIT ..... 66
AIR DUCTING WORK ..... 69
DRAIN PIPING WORK ..... 73
REFRIGERANT PIPING ..... 74
EVACUATING ..... 75
ELECTRICAL WORK ..... 76
INSTALLATION/SERVICING TOOLS ..... 77
MAINTENANCE ..... 78

# RAV-SM560KRT-E/RAV-SM800KRT-E

## INSTALLATION MANUAL


Accessory parts and Parts to be procured locally ..... 91
PRECAUTIONS FOR SAFETY ..... 92
INSTALLATION PROCEDURE ..... 94
SELECTION OF INSTALLATION PLACE ..... 95
INSTALLATION OF INDOOR UNIT ..... 95
DRAIN PIPING WORK ..... 96
REFRIGERANT PIPING ..... 98
EVACUATING ..... 99
ELECTRICAL WORK ..... 102
IMPROVING SYSTEM EFFICIENCY ..... 104
FINAL INSTALLATION CHECKS ..... 104
ENVIRONMENT ..... 106

## INSTALLATION MANUAL


Ceiling Panel — RBC-U21PG (W)-E ..... 125
Standard Remote Controller — RBC-AMT21E ..... 127
Simple Remote Controller — RBC-AS21E ..... 128
Program Weekly Timer — RBC-EXW21E ..... 129
Remote sensor — TCB-TC21LE ..... 130
Drain-up Kit for Concealed Duct Type Indoor Unit — TCB-DP11BE ..... 131
Remote Controller Wireless Kit — TCB-AX21U (W)-E ..... 132

# 1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this "PRECAUTIONS FOR SAFETY" carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
  Follow the Owner's Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner's Manual.

**CAUTION** **New Refrigerant Air Conditioner Installation**

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

**CAUTION** **To Disconnect the Appliance from Main Power Supply.**

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

**The installation fuse (25A D type ) must be used for the power supply line of this conditioner.**

**⚠ WARNING**

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
  Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting cable correctly.**
  If the connecting cable is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
  If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may resultingly causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
  Do not store it in a wet basement or expose to rain or water.

- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
  If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
  If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
  An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Be sure to provide grounding.**
  Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone cables.
- **Conform to the regulations of the local electric company when wiring the power supply.**
  Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
  If a combustible gas leaks, and stays around the unit, a fire may occur.

**Required tools for installation work**

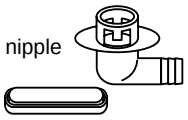
1) Philips screw driver
2) Hole core drill (65 mm)
3) Spanner
4) Pipe cutter
5) Knife
6) Reamer
7) Gas leak detector
8) Tape measure
9) Thermometer
10) Mega-tester
11) Electro circuit tester
12) Hexagonal wrench
13) Flare tool
14) Pipe bender
15) Level vial
16) Metal saw

**R410A (Special requirement)**

17) Gauge manifold
    (Charge hose : R410A special requirement)
18) Vacuum pump
    (Charge hose : R410A special requirement)
19) Torque wrench
    1/4 (17 mm) 16 N•m (1.6 kgf•m)
    3/8 (22 mm) 42 N•m (4.2 kgf•m)
    1/2 (26 mm) 55 N•m (5.5 kgf•m)
    5/8 (15.9 mm) 120 N•m (12.0 kgf•m)
20) Copper pipe gauge adjusting projection margin
21) Vacuum pump adapter

# 2 ACCESSORY AND REFRIGERANT

## Accessory and Installation Parts

| | | | |
|---|---|---|---|
| ① | Outdoor unit<br>Installation manual x 1 | ③ | Protective bush<br>(For SM800AT only) |
| ② |  Drain nipple<br>Waterproof rubber cap | ④ | Guard material for passage part<br>(For SM800AT only) |

## Refrigerant Piping

- Piping kit used for the conventional refrigerant cannot be used.
- Use copper pipe with 0.8 mm or more thickness for Ø6.4, Ø9.5, Ø12.7.

  Use copper pipe with 1.0 mm or more thickness for Ø15.9.
- Flare nut and flare works are also different from those of the conventional refrigerant. Take out the flare nut attached to the main unit of the air conditioner, and use it.

# 3 SELECTION OF INSTALLATION

## Before installation

Be careful to the following items before installation.

### Length of refrigerant pipe

**<SM560AT-E>**

| Length of refrigerant pipe connected to indoor/outdoor unit | Item |
|---|---|
| 20m or shorter | Addition of refrigerant is unnecessary at the local site. |
| *21m to 30m | <Addition of refrigerant><br>Add 20g of refrigerant for every 1m of pipe which exceeds 20m. |

* Caution at addition of refrigerant

When the total length of refrigerant pipe exceeds 20m, add 20g/m of refrigerant and the maximum total length of pipe is 30m.
(Max. amount of additional refrigerant is 200g.)

Charge the refrigerant accurately. Overcharge may cause a serious trouble of compressor.

**<SM800AT-E>**

| Length of refrigerant pipe connected to indoor/outdoor unit | Item |
|---|---|
| 20m or shorter | Addition of refrigerant is unnecessary at the local site. |
| *21m to 50m | <Addition of refrigerant><br>Add 40g of refrigerant for every 1m of pipe which exceeds 20m. |

***** Caution at addition of refrigerant

When the total length of refrigerant pipe exceeds 20m, add 40g/m of refrigerant and the maximum total length of pipe is 50m.
(Max. amount of additional refrigerant is 1200g.)

Charge the refrigerant accurately. Overcharge may cause a serious trouble of compressor.

### Air purge

- For air purge, use a vacuum pump.
- Do not use refrigerant charged in the outdoor unit for air purge. (The refrigerant for air purge is not contained in the outdoor unit.)

### Electrical cabling

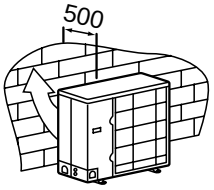
- Be sure to fix the power cables and indoor/outdoor connecting cables with clamps so that they do not contact with the cabinet, etc.

## Installation Place

- A place which provides a specified space around the outdoor unit.
- A place where the operation noise and discharged air are not given to your neighbors.
- A place that is not exposed to a strong wind.
- A place that does not block a passage.
- When the outdoor unit is installed in an elevated position, be sure to secure its feet.
- There must be sufficient space for carrying in the unit.
- A place where the drain water does not make any problem.

### CAUTION

1. Install the outdoor unit at a place where discharge air is not blocked.
2. When an outdoor unit is installed in a place that is always exposed to a strong wind like a coast or on a high storey of a building, secure a normal fan operation by using a duct or a wind shield.
3. When installing the outdoor unit in a place that is constantly exposed to a strong wind such as the upper stairs or rooftop of a building, apply the windproof measures referring to the following examples.
   1) Install the unit so that its discharge port faces to the wall of the building. Keep a distance 500 mm or more between the unit and the wall surface.




   2) Supposing the wind direction during the operation season of the air conditioner, install the unit so that the discharge port is set at right angle to the wind direction.

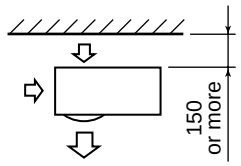
4. Installation in the following places may result in some troubles. Do not install the unit in such places below.
   - A place full of machine oil.
   - A place full of sulphuric gas.
   - A place where high-frequency radio waves are likely to be generated as from audio quipment, welders, and medical equipment.

## Necessary Space for Installation

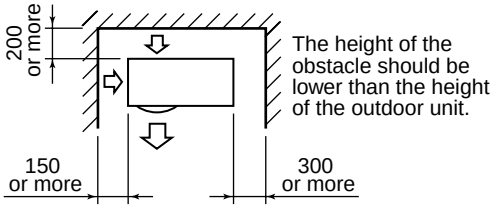
### Obstacle at rear side

**<Upper side is free>**

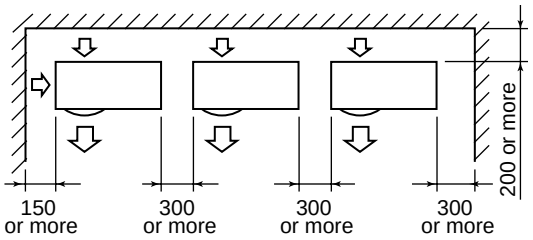
1. Single unit installation




2. Obstacles at both right and left sides.

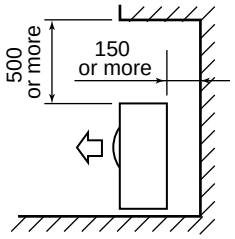



3. Serial installation of two or more units




The height of the obstacle should be lower than the height of the outdoor unit.

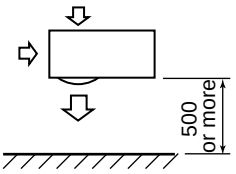
**<Obstacle also at the upper side>**



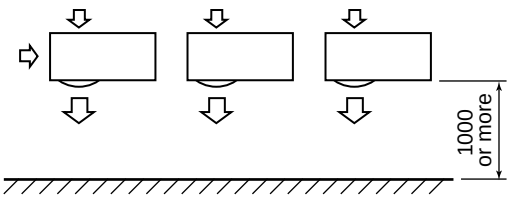

### Obstacle at front side

**<Upper side is free>**

1. Single unitIn installation

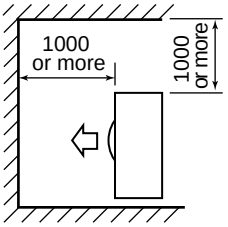



2. Serial installation of two or more units



# 3 SELECTION OF INSTALLATION

**<Obstacle also at the upper side>**

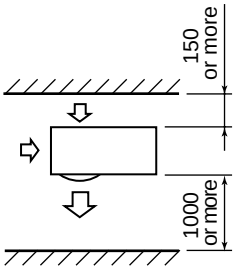



## Obstacles at both front and rear sides

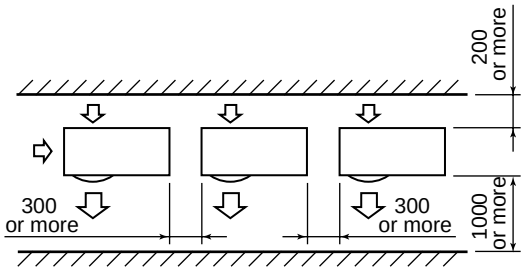
Open the upper side and both right and left sides. The height of obstacle at both front and rear side, should be lower than the height of the outdoor unit.

**<Standard installation>**

1. Single unit installation



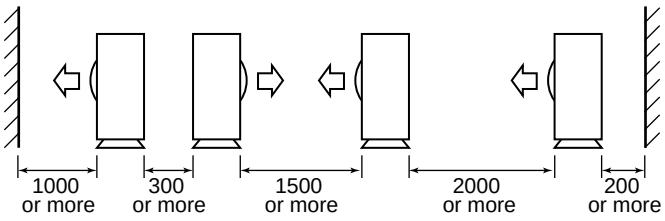

2. Serial installation of two or more units




## Serial installation at front and rear sides

Open the upper side and both right and left sides. The height of obstacle at both front and rear sides should be lower than the height of the outdoor unit.

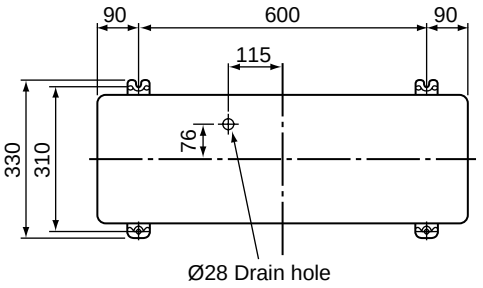
**<Standard installation>**



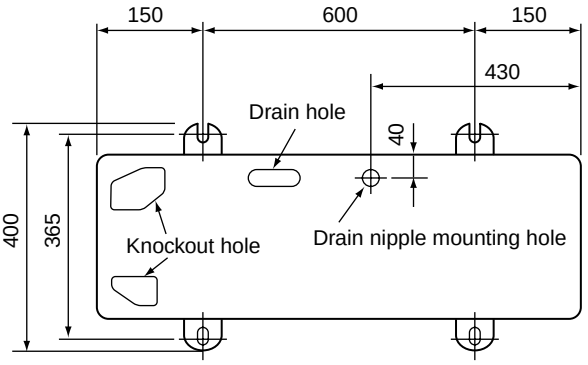

## Installation of Outdoor Unit

- Before installation, check strength and horizontality of the base so that abnormal sound does not generate.
- According to the following base diagram, fix the base firmly with the anchor bolts.
  (Anchor bolt, nut: M10 x 4 pairs)

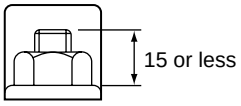
**<SM560AT-E>**



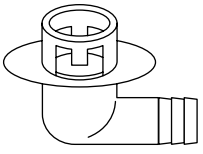

**<SM800AT-E>**



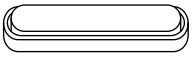

Set the out margin of the anchor bolt to 15mm or less.




- In case of drainning through the drain hose, attach the following drain nipple and the waterproof rubber cap, and use the drain hose (Inner diam.: 16mm) sold on the market. And also seal the screws securely with silicone material, etc. so that water does not drop down. Some conditions may cause dewing or dripping of water.

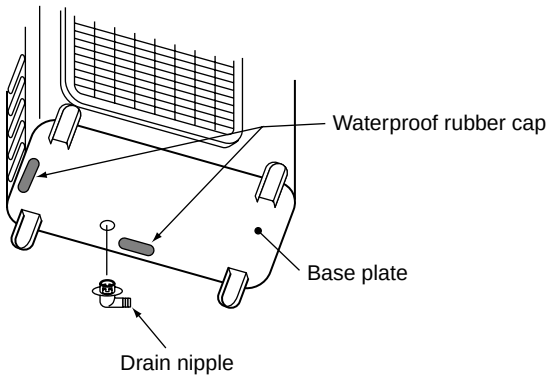


**Drain nipple**

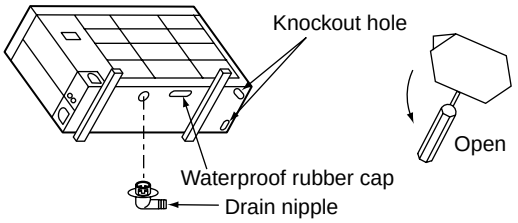


**Waterproof rubber cap**

**<SM560AT-E>**




**<SM800AT-E>**




- When there is a possibility of freezing of drain at the cold district or a snowfall area, be careful for drainage ability of drain. The drainage ability increases when a knockout hole on the base plate is opened. (Open the knockout hole to outside using a screwdriver, etc.)

## Optional Installation Parts (Local Procure)

| | Parts name | Q'ty |
|---|---|---|
| **A** | Refrigerant piping<br>Liquid side : Ø6.35 mm or Ø9.52 mm<br>Gas side : Ø12.7 mm or Ø15.9 mm | Each one |
| **B** | Pipe insulating material<br>(polyethylene foam, 6 mm thick) | 1 |
| **C** | Putty, PVC tapes | Each one |

## Refrigerant Piping Connection

**CAUTION**

**TAKE NOTICE THESE IMPORTANT 4 POINTS BELOW FOR PIPING WORK**

1. Keep dust and moisture away from inside the connecting pipes.
2. Tightly connect the connection between pipes and the unit.
3. Evacuate the air in the connecting pipes using VACUUM PUMP.
4. Check gas leak at connected points.

**<Piping connection>**

| Capacity rank / RAV- | Liquid side | | Gas side | |
|---|---|---|---|---|
| | Outer diameter | Thickness | Outer diameter | Thickness |
| **SM560** | Ø6.4 | 0.8 | Ø12.7 | 0.8 |
| **SM800** | Ø9.5 | 0.8 | Ø15.9 | 1.0 |

## For Reference

If a heating operation would be continuously performed for a long time under the condition that the outdoor temperature is 0°C or lower, draining of defrosted water may be difficult due to freezing of the bottom plate, resulting in a trouble of the cabinet or fan.

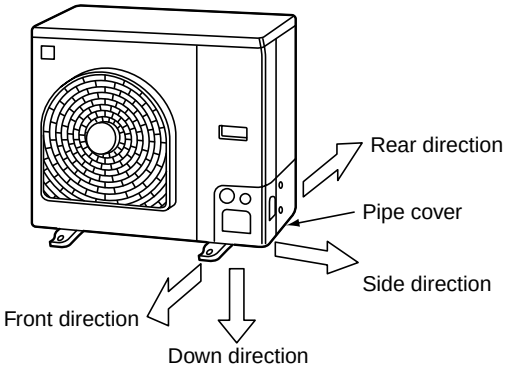
It is recommended to procure an anti-freeze heater locally for a safety installation of the air conditioner.

For details, contact the dealer.

# 3 SELECTION OF INSTALLATION

## Knockout of Pipe Cover

**<SM800AT-E>**

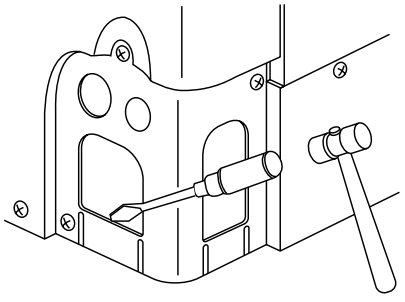



### Knockout procedure

- The indoor/outdoor connecting pipes can be connected to 4 directions.

  Take off the knockout part of the pipe cover in which pipes or wires pass through the base plate.
- As shown in the figure, do not remove the pipe cover from the cabinet so that the knockout hole can be easily punched. To knock out, it is easily taken off by hands by punching a position at the lower side of 3 connected parts with screwdriver along the guide line.
- After marking the knockout hole, remove the burr and mount the attached protective bush and guard material for pass-through part in order to protect pipes and wires.

After connecting the pipes, be sure to mount the pipe cover. The pipe cover is easily mounted by cutting off the slit at the lower part of the pipe cover.



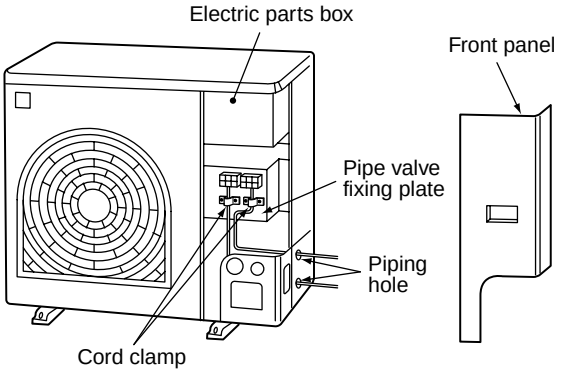
### How to remove the front panel

1. Remove screws of the front panel.
2. Pull the front panel downward.

Removing the front panel, the electric parts appear at the front side.

- The metal pipes are attachable to the piping holes. If the size of the used power pipe does not match with the hole, adjust the hole size to match with pipe size.
- Be sure to fix the power cable and indoor/outdoor connecting cable with bundling band sold on the market so that they do not make contact with the compressor and discharge pipe. (Temperature of the compressor and discharge pipe becomes high.)

  In order to avoid the force applied to on the connecting section, be sure to fix the cables to the cord clamps provided on the pipe valve fixing plate and the electric parts box.

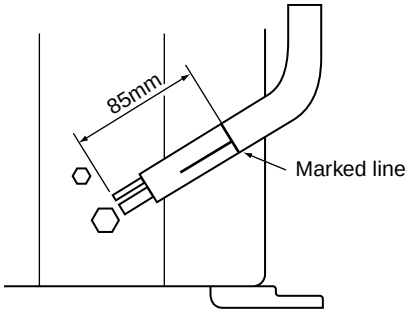


# 4 REFRIGERANT PIPING

## Pipe Forming/End Positioning

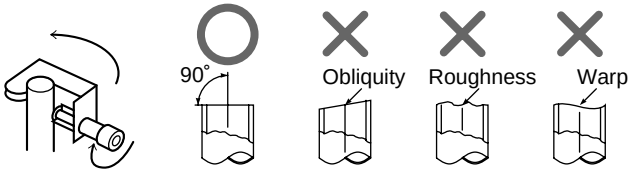
**<SM560AT-E>**

- Forming of pipe
  Form the pipe along with a marked line of the cabinet.
- End positioning of pipe
  Match the ends of both pipes at at a distance of 85 mm apart from the marked line.

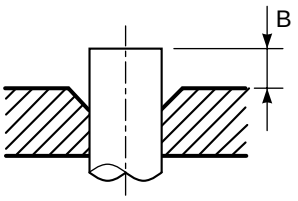



## Flaring

1. Cut the pipe with a pipe cutter.



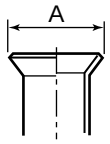

2. Insert a flare nut into the pipe, and flare the pipe.
   As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.
   However, the conventional tools can be used by adjusting projection margin of the copper pipe.




- **Flaring size : A (Unit : mm)**

| Outer dia. of copper pipe | A $^{+0}_{-0.4}$ | |
|---|---|---|
| | **R410A** | R22 |
| 6.35 | 9.1 | 9.0 |
| 9.52 | 13.2 | 13.0 |
| 12.7 | 16.6 | 16.2 |
| 15.9 | 19.7 | 19.4 |

* In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that of R22 to adjust to the specified flare size. The copper pipe gauge is useful for adjusting projection margin size.




- **Projection margin in flaring : B (Unit : mm)**

Rigid (Clutch type)

| Outer dia. of copper pipe | R410A tool used | | Conventional tool used | |
|---|---|---|---|---|
| | **R410A** | R22 | **R410A** | R22 |
| 6.35 | 0 to 0.5 | (Same as left) | 1.0 to 1.5 | 0.5 to 1.0 |
| 9.52 | 0 to 0.5 | (Same as left) | 1.0 to 1.5 | 0.5 to 1.0 |
| 12.7 | 0 to 0.5 | (Same as left) | 1.0 to 1.5 | 0.5 to 1.0 |
| 15.9 | 0 to 0.5 | (Same as left) | 1.0 to 1.5 | 0.5 to 1.0 |

Imperial (Wing nut type)

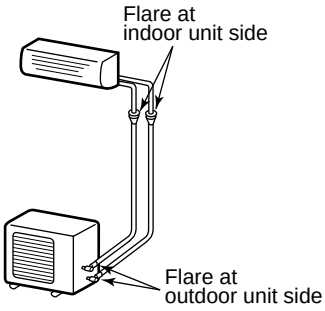
| Outer dia. of copper pipe | R410A | R22 |
|---|---|---|
| 6.35 | 1.5 to 2.0 | 1.0 to 1.5 |
| 9.52 | 1.5 to 2.0 | 1.0 to 1.5 |
| 12.7 | 2.0 to 2.5 | 1.5 to 2.0 |
| 15.9 | 2.0 to 2.5 | 1.5 to 2.0 |

# 4 REFRIGERANT PIPING

## Tightening of Connecting Part

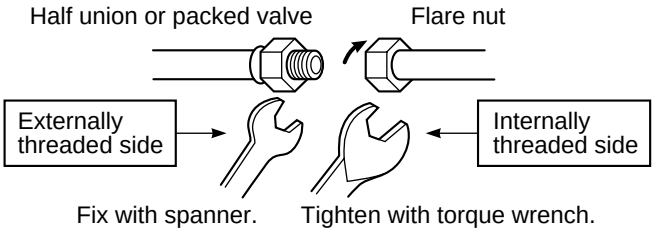
(Unit: N•m)

| Outer dia. of copper pipe | Tightening torque |
|---|---|
| 6.35mm (diam.) | 14 to 18 (1.4 to 1.8kgf•m) |
| 9.52mm (diam.) | 33 to 42 (3.3 to 4.2kgf•m) |
| 12.7mm (diam.) | 50 to 62 (5.0 to 6.2kgf•m) |
| 15.9mm (diam.) | 63 to 77 (6.3 to 7.7kgf•m) |



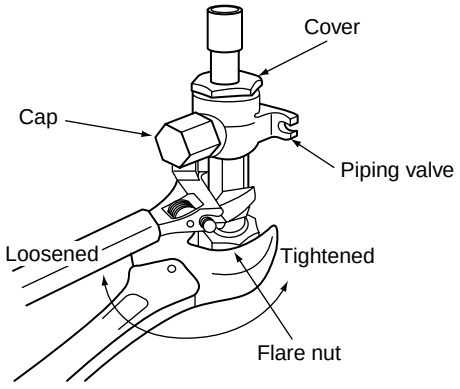

- Align the centers of the connecting pipes and tighten the flare nut strong as far as possible with your fingers.

  Then fix the nut with a spanner and tighten it with torque wrench as shown in the figure.




- As shown in the figure, be sure to use a double spanner to loosen or tighten the flare nut of the valve at gas side. If using a single spanner, the nut cannot be tightened with necessary tightening torque.

  On the contrary, use a single spanner to loosen or tighten the flare nut of the valve at liquid side.

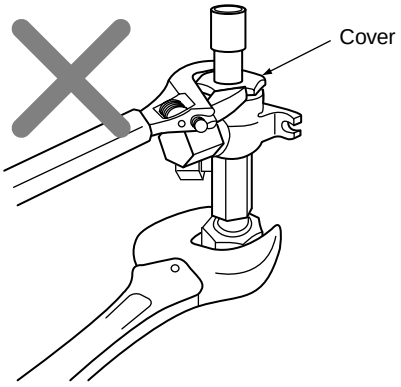



**SM800 type valve at gas side**

**REQUIREMENT**

1. Do not put the spanner on the cap. The valve may be broken.
2. If applying excessive torque, the nut may be broken according to some installation conditions.

- After the installation work, be sure to check gas leak of connecting part of the pipes with nitrogen.




- Pressure of R410A is higher than that of R22 (Approx. 1.6 times). Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor/outdoor units at the specified tightening torque. Incomplete connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.

**Do not apply refrigerating machine oil to the flared surface.**

# 5 EVACUATING

## Air Purge

This air conditioner can be installed up to the connecting pipe length and height difference in the following table.

| Capacity rank | Max. connecting pipe length (m) | Height difference (m) | | Hexagonal wrench size |
|---|---|---|---|---|
| | | Outdoor unit at upper side | Outdoor unit at lower side | |
| **SM560 type** | 30 | 30 | 15 | 4mm |
| **SM800 type** | 50 | 30 | 15 | |

With respect to the preservation of terrestrial environment, adopt “Vacuum pump” for air purge (Evacuate air in the connecting pipes) when installing the unit.

- Do not discharge the refrigerant gas to the atmosphere to preserve the terrestrial environment.
- Use a vacuum pump to discharge the air (nitrogen, etc.) remained in the set. If the air remains, the capacity may decrease.

For the vacuum pump, be sure to use one with backflow preventer so that the oil in the pump does not backflow into the pipe of the air conditioner when the pump stops. (If oil in the vacuum pump is put in an air conditioner including R410A, it may cause trouble on the refrigeration cycle.)

### Vacuum pump

As shown in the right figure, connect the charge hose after the manifold valve are closed completely.

↓

Attach the connecting port of the charge hose with a projection to push the valve core (setting pin) to the charge port of the set.

↓

Open handle Low fully.

↓

Turn ON the vacuum pump (*1)

↓

Loosen the flare nut of the packed valve (Gas side) a little to check the air passes through. (*2)

↓

Tighten the flare nut again.

↓

Execute vacuuming until the compound pressure gauge indicates –101kPa (–76cmHg). (*1)

↓

Close handle Low completely.

↓

Turn OFF the vacuum pump.

↓

Leave the vacuum pump as it is for 1 or 2 minutes, and check the indicator of the compound pressure gauge does not return.

↓

Open fully the valve stem or the valve handle. (First, at liquid side, then gas side)

↓

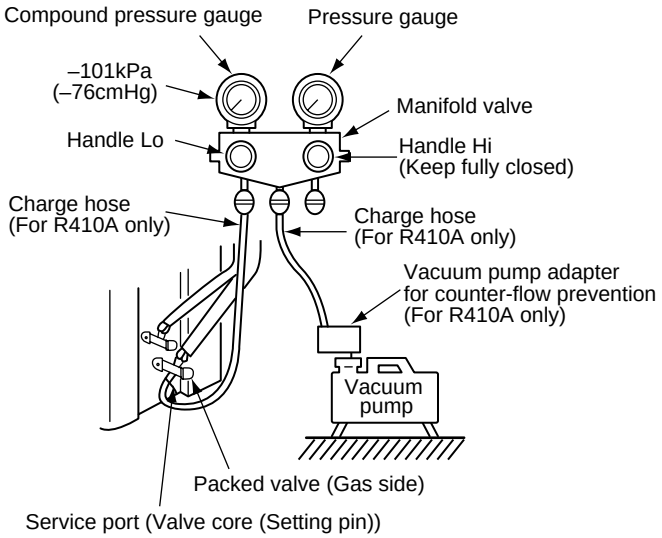
Disconnect the charge hose from the charge port.

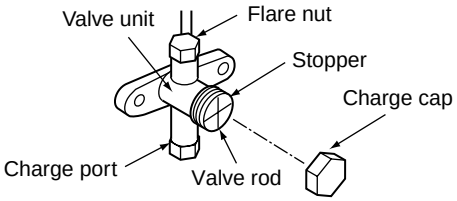
↓

Tighten valve and caps of the charge port surely.

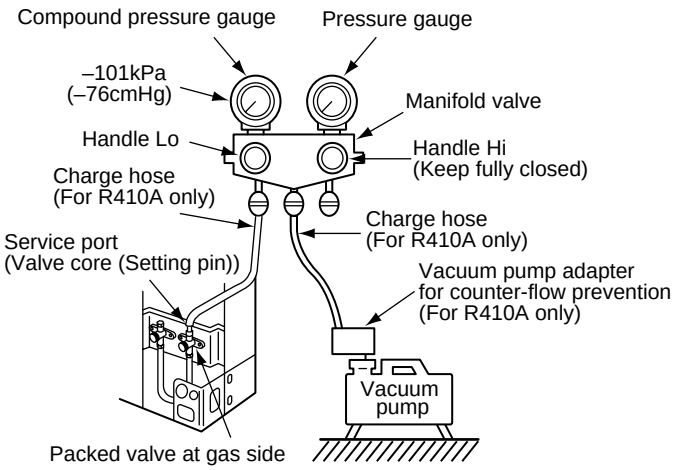
# 5 EVACUATING

**<SM560AT-E>**

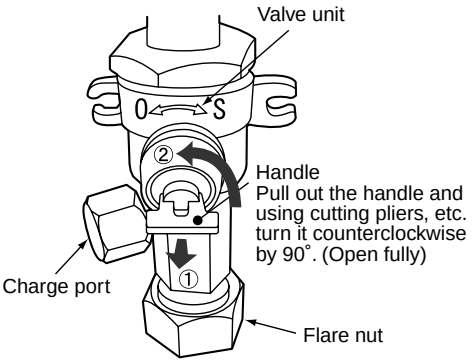


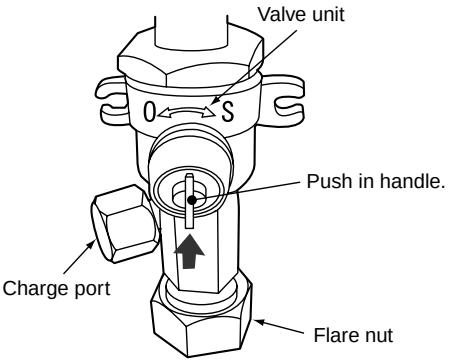

**<SM800AT-E>**



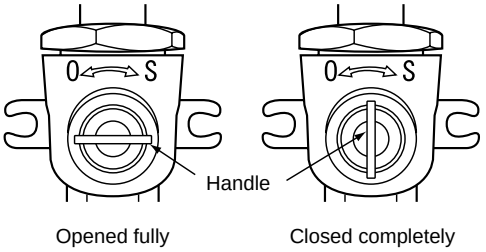

**OPEN**




**CLOSE**




**Handle position**




*1. Use the vacuum pump, vacuum pump adapters, and gauge manifold referring to the manuals attached to each tool before using them. For the vacuum pump, check oil is filled up to the specified line of the oil gauge.

*2. While the air is purged, check again that the connecting port of charge hose, which has a projection to push the valve core, is firmly connected to the charge port.

**Valve handling precautions**

- Open the valve stem or the handle until it strikes the stopper. It is unnecessary to apply further force.
- Securely tighten the cap with a torque wrench.
- Cap tightening torque

| | | |
|---|---|---|
| **Valve size** | Ø6.4 | 14 to 18N•m (1.4 to 1.8kgf•m) |
| | Ø9.5 | 33 to 42N•m (3.3 to 4.2kgf•m) |
| | Ø12.7 | 33 to 42N•m (3.3 to 4.2kgf•m) |
| | Ø15.9 | 20 to 25N•m (2.0 to 2.5kgf•m) |
| **Charge port** | | 14 to 18N•m (1.4 to 1.8kgf•m) |

# 6 ELECTRICAL WORK

For the air conditioner that has no power cable, connect a power cable as mentioned below.

| Model RAV- | SM560AT-E | SM800AT-E |
|---|---|---|
| **Power supply** | 220 – 240 V Single phase 50 Hz | |
| **Maximum running current** | 12A | 15A |
| **Installation fuse rating** | 25 A (D type ) | |
| **Power cable** | H07 RN-F or 245 IEC 66 (2.5 $mm^2$ or more) | |

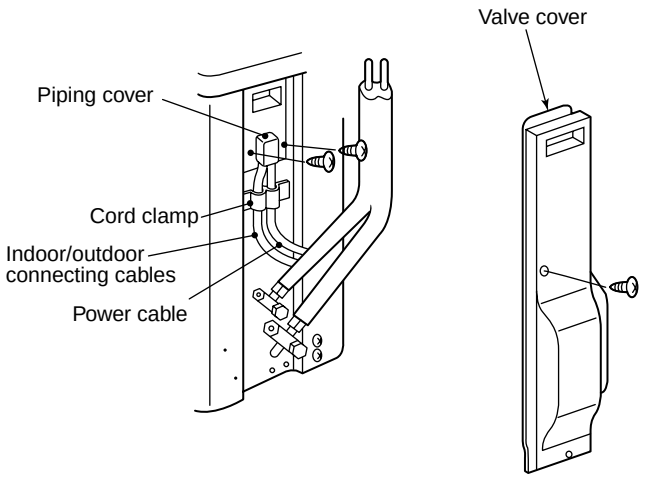
**CAUTION**

- Wrong wiring may cause a burn-out to some electrical parts.
- Be sure to use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting cables when peeling them.
- Be sure to comply with local regulations of the cable from outdoor unit to indoor unit. (wire size and cabling method etc.)
- Use the power and Inter-connecting cables with specified thickness, specified type and protective devices required.

**<SM560AT-E>**

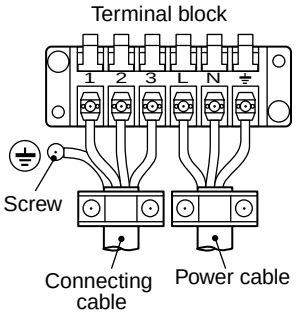
### How to remove the valve cover

1. Remove screws of the valve cover.
2. Pull the valve cover downward to remove it.

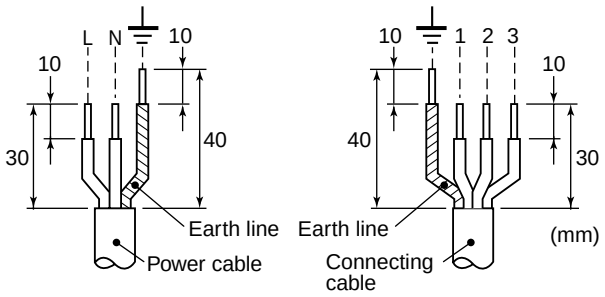



### How to wire

1. Connect the connecting cable to the terminal as identified with their respective numbers on the terminal block of indoor and outdoor unit. H07 RN-F or 245 IEC 66 (1.0 $mm^2$ or more)
2. When connecting the connecting cable to the outdoor unit terminal, prevent water coming in the outdoor unit.
3. Insulate the unsheathed cords (conductors) with electrical insulation tape. Process them so that they do not touch any electrical or metal parts.
4. For inter connecting cable, do not use a wire jointed to another on the way.
   Use wires long enough to cover the entire length.




### Stripping length power cord and connecting cable




**CAUTION**

- The installation fuse (25A D type ) must be used for the power supply line of this air conditioner.
- Incorrect/incomplete wiring might cause an electrical fire or smoke.
- Prepare the exclusive power supply for the air conditioner.
- This product can be connected to the mains.
  Connection to the fixed wiring :
  A switch which disconnects all poles and has a contact separation of at least 3 mm must be incorporated in the fixed wiring.

# 7 FINAL INSTALLATION CHECKS

## Check and Test Operation

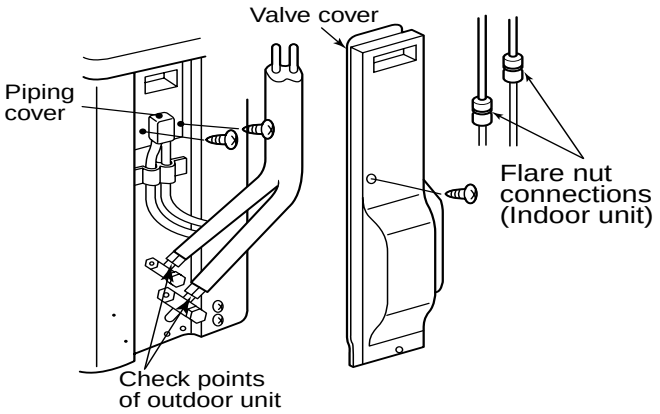
For R410A, use the leak detector exclusively manufactured for HFC refrigerant (R410A, R134a, etc.).

* The conventional leak detector for HCFC refrigerant (R22, etc.) cannot be used because its sensitivity for HFC refrigerant lowers to approx. 1/40.

- Pressure of R410A is approx. 1.6 times higher than that of R22.

  If installation work is incompletely finished, a gas leakage may occur when pressure rises during operation.

  Therefore, be sure to test the piping connections for leakage.
- Check gas leakage at the flare nut connections, valve stem cap connections and service port cap fittings with a leak detector or soap water.




**CAUTION**

When the remote controller is used for the first time, it accepts an operation approx. 5 minutes after the power supply has been turned on.

It is not a trouble, but is because the setup of the remote controller is being checked.

For the second power-ON time and after, approx. 1 munute is required to start the operation by the remote controller.

## Useful Functions (SM800AT-E only)

### Self-Diagnosis by LED Indication

In addition to the code checking by remote controller of the indoor unit, troubles of the outdoor unit can be diagnosed by LED indications on the cycle control P.C. board of the outdoor unit. Utilize them for various checks.
For the check by remote controller of the indoor unit, refer to the Installation Manual of the indoor unit.
Before a check, confirm each bit of the DIP switch is set to OFF position.

**LED indication and code checking**

| LED indication | Cycle control P.C. board LED indication | | | | Cause |
|---|---|---|---|---|---|
| | D800 | D801 | D802 | D803 | |
| D800 ○ : Red<br>D801 ○ : Yellow<br>D802 ○ : Yellow<br>D803 ○ : Yellow<br><br>◎ : Rapid flash<br>● : Go off<br>○ : Go on | ○ | ● | ● | ● | Heat exchanger sensor (TE) error |
| | ● | ● | ○ | ● | Suction sensor (TS) error |
| | ○ | ○ | ● | ● | Discharge sensor (TD) error |
| | ● | ○ | ● | ○ | High-pressure protection error |
| | ● | ○ | ● | ● | Outdoor temperature sensor (TO) error |
| | ○ | ○ | ○ | ● | DC outside fan error |
| | ○ | ● | ● | ○ | Communication error between IPDU (Abnormal stop) |
| | ● | ○ | ● | ○ | High-pressure release operation |
| | ● | ○ | ○ | ● | Discharge temp. error |
| | ○ | ○ | ● | ○ | EEPROM error |
| | ● | ● | ○ | ○ | Communication error between IPDU (No abnormal stop) |
| | ◎ | ● | ● | ● | G-Tr short-circuit protection |
| | ● | ◎ | ● | ● | Detect circuit error |
| | ◎ | ◎ | ● | ● | Current sensor error |
| | ● | ● | ◎ | ● | Comp. lock error |
| | ◎ | ● | ◎ | ● | Comp. break down |

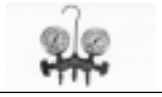
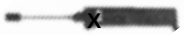
## Installation/Servicing Tools

**Changes in the product and components**

In the case of an air conditioner using R410A, in order to prevent any other refrigerant from being charged accidentally, service port diameter of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch)

- In order to increase the pressure resisting strength of the refrigerant piping flare processing diameter and size of opposite side of flare nuts has been changed. (for copper pipes with nominal dimensions 1/2 and 5/8)

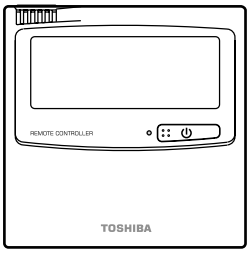
### New tools for R410A

| New tools for R410A | Applicable to R22 model | | Changes |
|---|---|---|---|
| Gauge manifold | ✕ |  | As pressure is high, it is impossible to measure by means of conventional gauge. In order to prevent any other refrigerant from being charged, each port diameter is changed. |
| Charge hose | ✕ | | In order to increase pressure resisting strength, hose materials and port size are changed (to 1/2 UNF 20 threads per inch).<br>When purchasing a charge hose, be sure to check the port size. |
| Electronic balance for refrigerant charging | ○ | | As pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur. |
| Torque wrench (nominal diam. 1/2, 5/8) | ✕ | | The size of opposite sides of flare nuts have been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8. |
| Flare tool (clutch type) | ○ | | By increasing the clamp bar's receiving hole, strength of spring in the tool has been improved. |
| Gauge for projection adjustment | — | — | Used when flare is made with using conventional flare tool. |
| Vacuum pump adapter | ○ | | Connected to the conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back to the charge hose. The charge hose connecting part has two ports-one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A.<br>If the vacuum pump oil (mineral) mixes with R410A a sludge may occur and damage the equipment. |
| Gas leakage detector | ✕ |  | Exclusive for HFC refrigerant. |

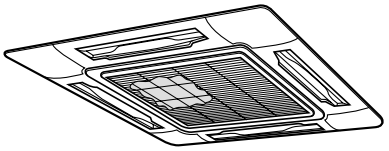
- Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the U,S.'s ARI specified rose color (ARI color code: PMS 507).
- Also, the "charge port and packing for refrigerant cylinder" require 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.

# ACCESSORIES (SOLD SEPARATELY)

**Remote controller**




**Standard 4-way cassette panel optional parts**



# PRECAUTIONS FOR SAFETY

## WARNING ⚠

### WARNINGS ABOUT INSTALLATION

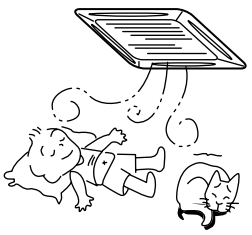
- Make sure to ask the qualified installation professional in electric work to install the air conditioner.
  If the air conditioner is inappropriate installed by yourself, it may cause water leak, electric shock, fire, and so on.
- Be sure to provide grounding.
  Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone cables.

## CAUTION

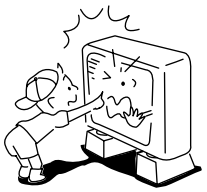
TO DISCONNECT THE APPLIANCE FROM THE MAINS SUPPLY

This appliance must be connected to the mains by means of a switch with a contact separation of at least 3 mm.

**The installation fuse (25A D type ) must be used for the power supply line of this conditioner.**



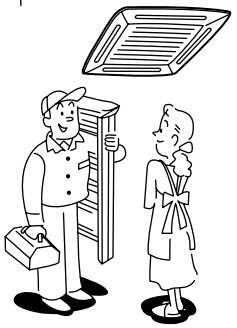
### WARNINGS ABOUR OPERATION



- Cleaning of the air filter and other parts of the air filter involves dangerous work in high places, so be sure to have a service person do it. Do not attempt it yourself.
  The cleaning diagram for the air filter is there for the service person, and not for the customer.
- Avoid cooling the room too strong or exposing the human body to cool breeze for a long time as it is bad for the health.

- When you notice something abnormal with the air conditioner (smells like something scorching, poor cooling, etc.), immediately turn off the main switch, the circuit breaker, from the mains to stop the air conditioner, and contact the dealer.
  If the air conditioner is continuously operated with something abnormal, it may cause machine failure, electric shock, fire, and so on.

### WARNINGS ABOUT MOVEMENT AND REPAIR

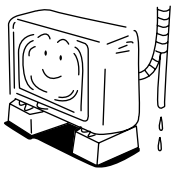


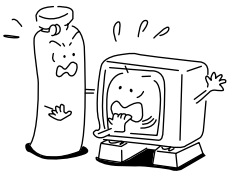
- Do not move or repair any unit by yourself.
  Since there is high voltage inside the unit, you may get electric shock when removing the cover and main unit.
- Whenever the air conditioner needs repair, make sure to ask the dealer to do it.
  If it is repaired imperfectly, it may cause electric shock or fire.
- When moving the air conditioner for re-installing at another place, ask the dealer to do it. If it is imperfectly installed, it may cause electric shock or fire.

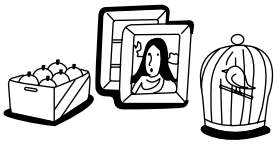
## CAUTION

### CAUTIONS ABOUT INSTALLATION

- Be sure to confirm the following cautions.
- Certainly lay the drain hose for perfect draining.
  Bad drainage may cause flooding in the house and getting furniture wet.
- Make sure to connect the air conditioner to an exclusive power supply of the rated voltage, otherwise the unit may break down or cause a fire.
- Do not install the unit in a place where inflammable gas may leak.
  If inflammable gas accumulates around the unit, it may cause a fire.

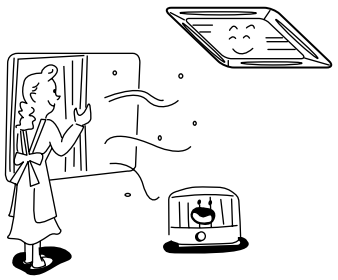


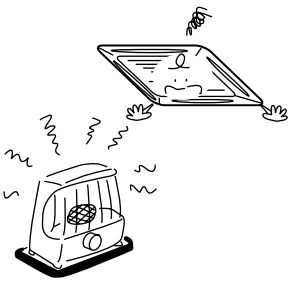


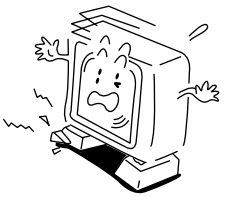


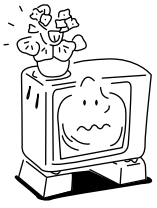
### CAUTIONS ABOUT OPERATION

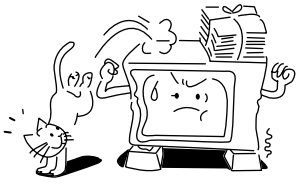
- Carefully read this manual before starting the air conditioner.
  There are many important things to keep in mind for daily operation.
- Do not use this air conditioner for special purpose such as preserving food, precision instruments, art objects, breeding animals, growing potted plants, etc.
- Avoid exposing potted plants and animals to the wind of the air conditioner, since it badly affects the health and growth of them.
- When the air conditioner is operated with a combustion appliance in the same place, be careful of ventilation to let fresh air enter the room.
  Poor ventilation causes oxygen shortage.
- Do not place any combustion appliance in a place where it is directly exposed to the wind of air conditioner, otherwise it may cause imperfect combustion.
- When the air conditioner is used in a closed room, be careful of sufficient ventilation of the room. Poor ventilation causes oxygen shortage.
- Do not touch any switches with wet finger, otherwise you may get an electric shock.
- If the air conditioner won't be used for a considerably long time, turn off the main switch or the circuit breaker, for safety.
- Check the concrete blocks, etc. of the base of the outdoor unit occasionally.
  If the base is left damaged or deteriorated, the unit may topple over and inflict an injury to a person as the worst case.
- Do not put anything on the outdoor unit nor step onto it. If you do so, it may not only topple over the unit but also injure yourself.
- To make the air conditioner operate in its original performance, operate it within the range of the operating temperature specified in the instructions.
  Otherwise it may cause a malfunction, or water leak from the unit.
- Prevent any liquid from falling into the remote controller. Do not spill juice, water or any kind of liquid.











# PARTS NAME

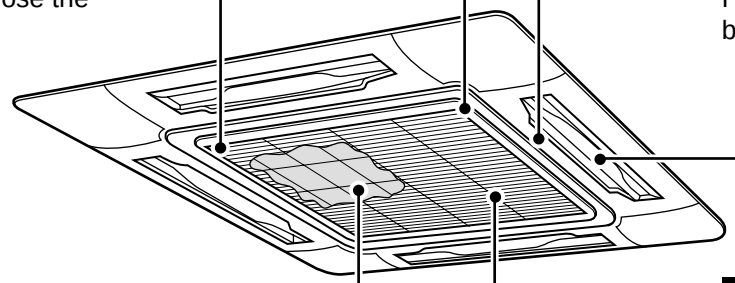
## Indoor unit

**Button**

Button to open/close the suction port

**Earth screw**

Provided in the electric parts box



**Air filter**

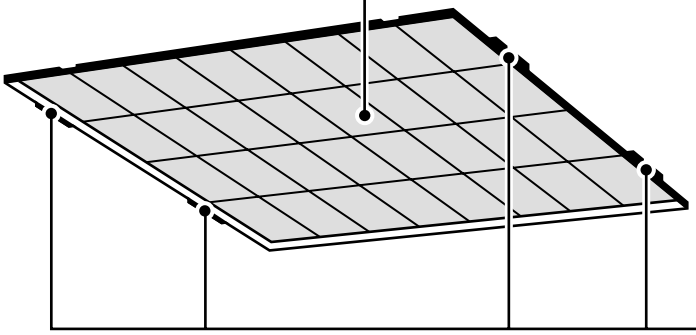
Removes dust or trash.
(Provided on the suction port.)

**Discharge flap of discharge port**

Change the direction of the air to be discharged according to cool/heat mode.

**Suction air port**

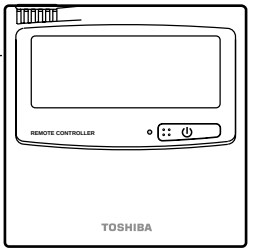
The air in the room is sucked in from this port.



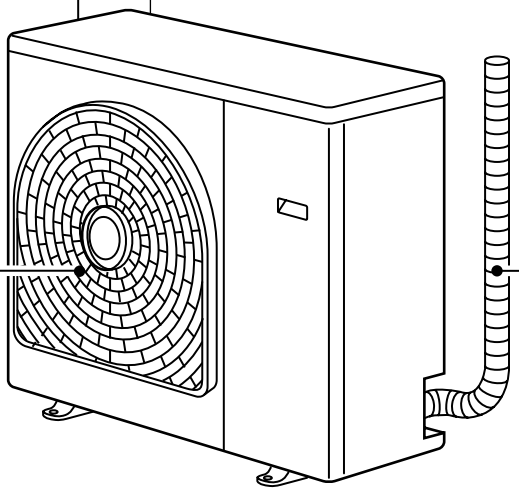
**Projection of air filter**

## Outdoor unit

Remote controller




Air inlet (Side and rear)



Air outlet

Pipes and electric wires

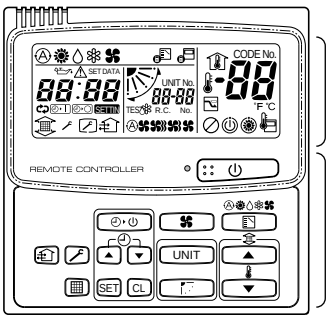
# PARTS NAME OF REMOTE CONTROLLER

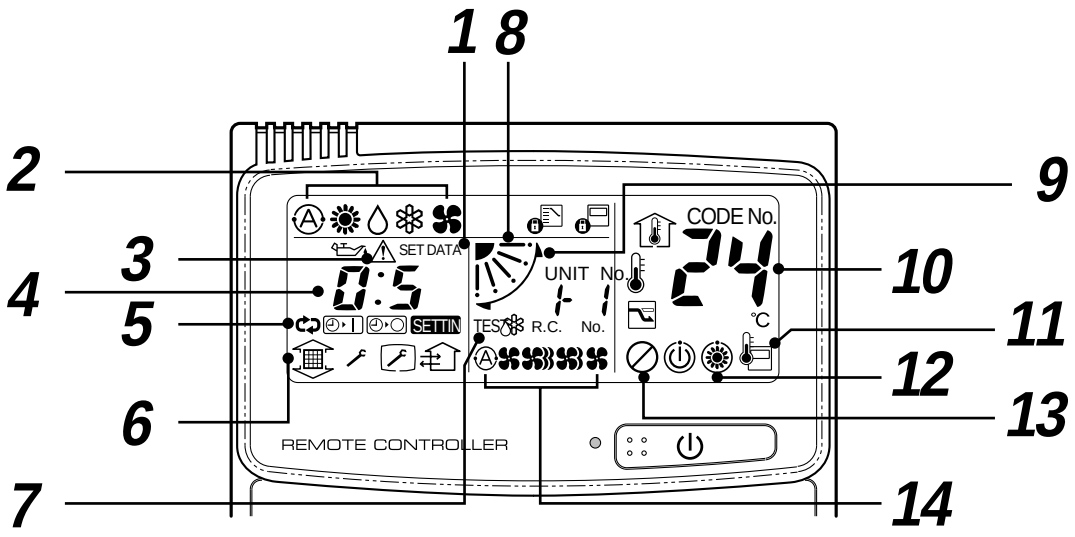
## Display section

In the display example, all indicators are displayed for the explanation.

In reality only, the selected contents are indicated.

- When turning on the leak breaker at the first time, [**SET DATA]** flashes on the display part of the remote controller. While this display is flashing, the model is being automatically confirmed. Accordingly, wait for a while after [**SET DATA]** display has disappeared, and then use the remote controller.




**1** **SET DATA display**

Displayed during setup of the timer.

**2** **Operation mode select display**

The selected operation mode is displayed.

**3** **CHECK display**

Displayed while the protective device works or a trouble occurs.

**4** **Timer time display**

Time of the timer is displayed.
(When a trouble occurs, the check code is displayed.)

**5** **Timer SETIN setup display**

When pushing the Timer SETIN button, the display of the timer is selected in order of [OFF]
→ [OFF] repeat OFF timer → [ON]
→ No display.

**6** **Filter display**

If "FILTER" is displayed, clean the air filter.

**7** **TEST run display**

Displayed during a test run.

**8** **Flap position display**

Displays flap position.

**9** **SWING display**

Displayed during up/down movement of the flap.

**10** **Set up temperature display**

The selected set up temp. is displayed.

**11** **Remote controller sensor display**

Displayed while the sensor of the remote controller is used.

**12** **PRE-HEAT display**

Displayed when the heating operation starts or defrost operation is carried out.

While this indication is displayed, the indoor fan stops or the mode enters in LOW.

**13** **No function display**

Displayed if there is no function even if the button is pushed.

**14** **Air volume select display**

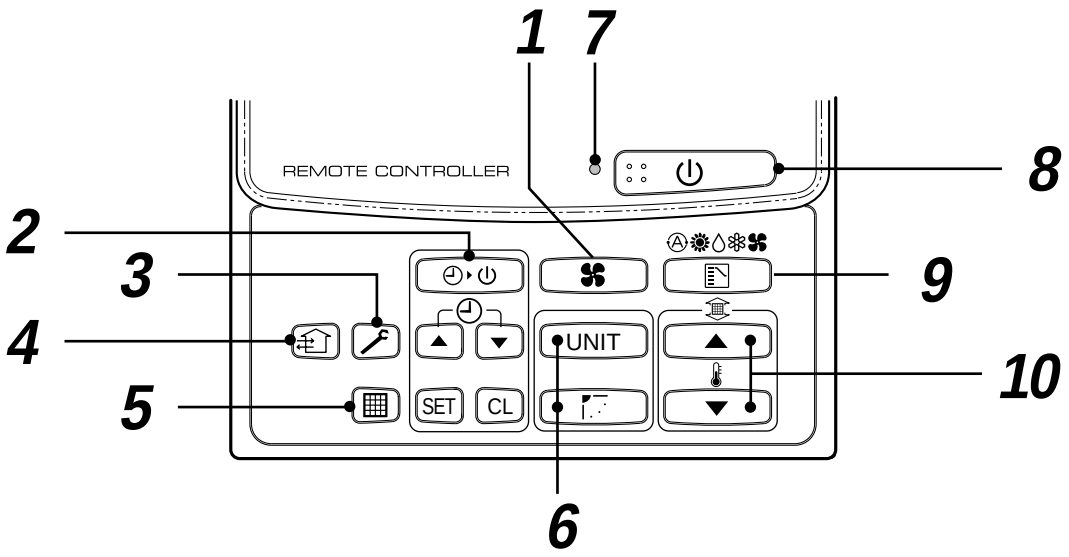
The selected air volume mode is displayed.

(AUTO)
(HIGH)
(MED.)
(LOW)

## Operation section

Push each button to select a desired operation.

- The details of the operation needs to be set up once, afterward, the air conditioner can be used by pushing ( ) button only.




**1** **Air volume select button**

Selects the desired air volume mode.

**2** **Timer set button**

TIMER SET button is used when the timer is set up.

**3** **Check button**

The CHECK button is used for the check operation. During normal operation, do not use this button.

**4** **Fan button**

FAN button is used when a fan which is sold on the market or etc. is connected.

- If “No function” is displayed on the remote controller when pushing the FAN button, a fan is not connected.

**5** **Filter reset button**

Resets (Erases) “FILTER ( )” display.

**6** **UNIT and AUTO flap button**

( UNIT ) (No function)

( )

**7** **Operation lamp**

Lamp is lit during the operation. Lamp is off when stopped.

Although it flashes when operating the protection device or abnormal time.

**8** ( ) **button**

When the button is pushed, the operation starts, and it stops by pushing the button again.

When the operation has stopped, the operation lamp and all the displays disappear.

**9** **Operation select button**

Selects desired operation mode.

**10** **Set up temperature button**

Adjusts the room temperature.

Set the desired set temperature by pushing ( ) or ( ).

**OPTION :**

**Remote controller sensor**

Usually the TEMP. sensor of the indoor unit senses the temperature. The temperature on the surrounding of the remote controller can also be sensed. For details, contact the dealer from which you have purchased the air conditioner.

# CORRECT USAGE

When you use the air conditioner for the first time or when you change the SET DATA value, follow the procedure below. From the next time, the operation displayed on the remote controller will start by pushing the [ ⏻ ] button only.

## Preparation

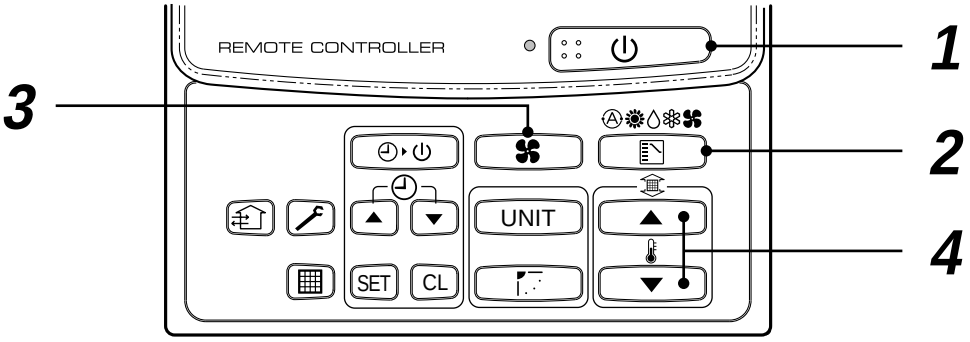
**Turn on the main power switch and/or the leakage breaker.**

- When the power supply is turned on, a partition line is displayed on the display part of the remote controller.

* After the power supply is turned on, the remote controller does not accept an operation for approx. 1 minute, but it is not a failure.

**REQUIREMENT**

- While using the air conditioner, operate it only with [ ⏻ ] button without turning off the main power switch and the leak breaker.

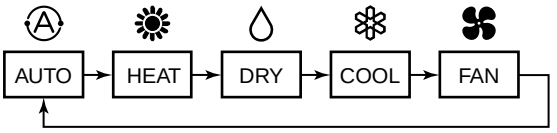



***1*** **Push [ ⏻ ] button.**

The operation lamp goes on, and the operation starts.

***2*** **Select an operation mode with the "MODE" button.**

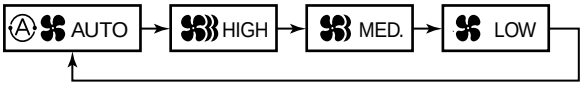
One push of the button, and the display changes in the order shown on the right.




- In HEAT mode, if the room temperature reaches to the set temperature, the outdoor unit stops and the air flow becomes LOW and the air volume decreases.
- In the defrost mode, the fan stops so that cool air is not discharged and PRE-DEF is displayed.

***3*** **Select air volume with "FAN" button.**

One push of the button, and the display changes in the order shown on the right.




- When air volume is "AUTO", air volume differs according to the room temperature.
- In DRY mode, "AUTO" is displayed and the air volume is LOW.
- In heating operation, if the room temperature is not heated sufficiently with VOLUME "LOW" operation, select "MED." or "HIGH" operation.

***4*** **Determine the set up temperature by pushing the "TEMP. [ ▲ ]" or "TEMP. [ ▼ ]" button.**

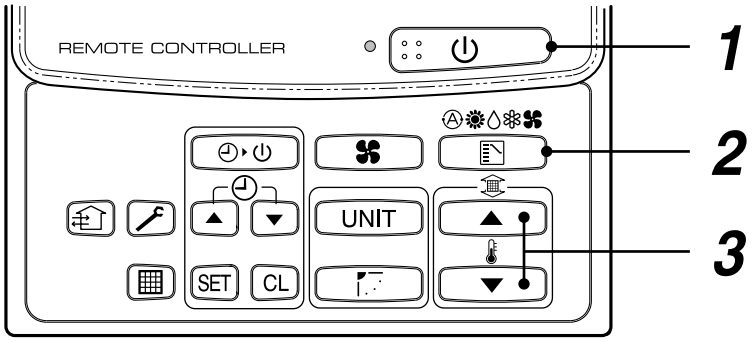
## Stop

**Push [ ⏻ ] button.**

The operation lamp goes off, and the operation stops.

## AUTOMATIC OPERATION (Auto Changeover)

When you set the air conditioner in Ⓐ mode or switch over from AUTO operation because of some settings change, it will automatically select either cooling, heating, or fan only operation depending on the indoor temperature.




### Start

***1*** **button**

Push this button to start the air conditioner.

***2*** **Mode select button (MODE)**

Select Auto.

***3*** **Temperature button**

Set the desired temperature.

- In case of cooling, start the operation after approx. 1 minute.
- In case of heating, the operation mode is selected in accordance with the room temperature and operation starts after approximately 3 to 5 minutes.
- When you select the Auto mode, it is unnecessary to set the fan speed. The FAN speed display will show AUTO and the fan speed will be automatically controlled.
- After the heating operation has stopped, FAN operation may continue for approx. 30 seconds.
- When the room temperature reaches the set temperature and the outdoor unit stops, the supper low wind is discharged and the air volume decreases excessively. During defrost operation, the fan stops so that cool air is not discharged and “HEAT READY” is displayed.
- If the Auto mode is uncomfortable, you can select the desired conditions manually.

**NOTE**

**When restarting the operation after stop**

- When restarting the operation immediately after stop, the air conditioner does not operate for approx. 3 minutes to protect the machine.

### Stop

**Push button.**

Push this button again to stop the air conditioner.

# ADJUSTMENT OF WIND DIRECTIONd

- When the air conditioner stops, the flap (adjustment plate of up/down wind direction) directs downward automatically.
- When the heating operation is in READY states, the flap (adjustment plate of up/down wind direction) directs upward. The swinging starts after HEAT READY status cleared, SWING is displayed on the remote controller even if the heating operation is in READY status.

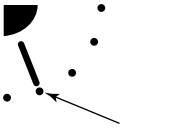
## How to set up the wind direction

**1** **Push [ ] during operation.**

The wind direction changes for every push of the button.

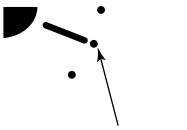
### In HEAT operation

Direct the flap (adjustment plate of up/down wind direction) downward. If directing at upward, hot air may not come to the foot.




### In COOL/DRY operation

Direct the flap (adjustment plate of up/down wind direction) upward. If directing it downward, the dew may from on the surface of the air discharge port and may drop down.




## How to start swinging

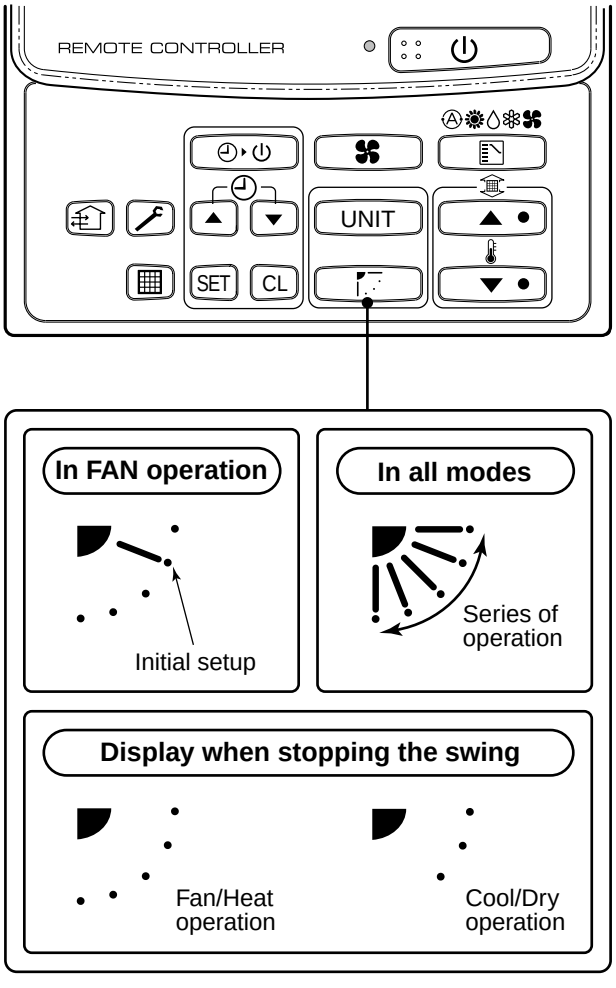
**1** **Push [ ], set the flap (adjustment plate of up/down wind direction) direction to the lowest position, and then push [ ] again.**

SWING is displayed and the up/down wind direction is automatically selected.

## How to stop swinging

**1** **Push SWING/WIND again while the flap is swinging.**

- The flap stops at a position when you push. After then, if pushing [ ], the wind direction descends from the highest position.
- In COOL/DRY operation, the flap does not stop as it directs downward. If stopping the flap as it directs downward during swing operation, it stops after moving to the 3rd position from the highest position.



# TIMER OPERATION

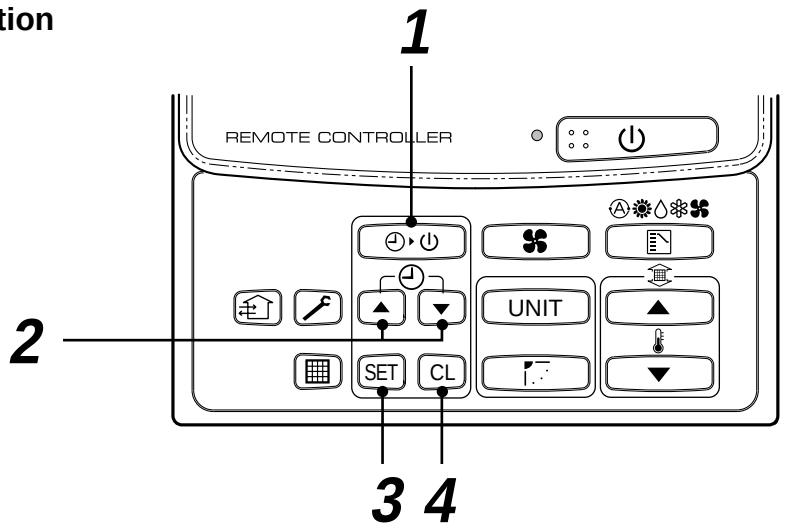
A type of timer operation can be selected from the following three types.

OFF timer : The operation stops when the time of timer has reached the set time.

Repeat OFF timer : Every time, the operation stops after the set time has passed.

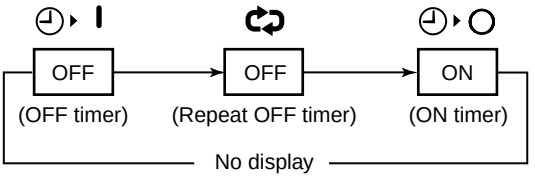
ON timer : The operation starts when the time of timer has reached the set time.

## Timer operation




**1 Push TIMER SET button.**

- The timer display (type) changes for every push of the button.
- SET DATA and ⏲▸◯ display flashes.




**2 Push ▲ ▼ to select "SET TIME".**

For every push of ▲ button, the set time increases in the unit of 0.5 hr (30 minutes).
The maximum set time is 72.0 hr.
For every push of ▼ button, the set time decreases in the unit of 0.5 hr (30 minutes).
The minimum set time is 0.5 hr.

**3 Push SET button.**

- SET DATA display disappears and ⏲▸◯ display goes on.

  (When ON timer is activated, time is displayed, and after time of the timer has been up, displays other than ON disappear.)

## Cancel of timer operation

**4 Push CL button.**

- TIMER display disappears.

**NOTICE**

- When the operation stops after the timer reached the preset time, the Repeat OFF timer resumes the operation by pushing ⏻ button and stops the operation after the time of the timer has reached the set time.

## HINTS FOR ECONOMICAL OPERATION

**Maintain room temperature at comfortable level**
**Clean air filters**

The clogged air filter impairs the performance of the air conditioner.

**Never open doors and windows more often than necessary**

To keep cool or warm air in the room, never open doors and windows more often than necessary.

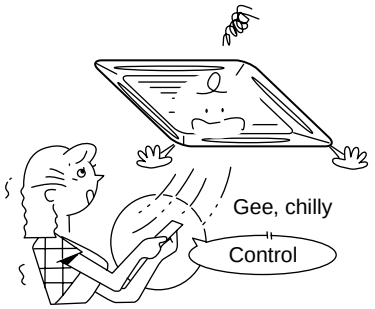
**Window curtains**

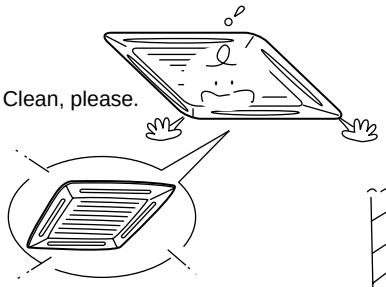
In cooling, close the curtains to avoid direct sunlight.

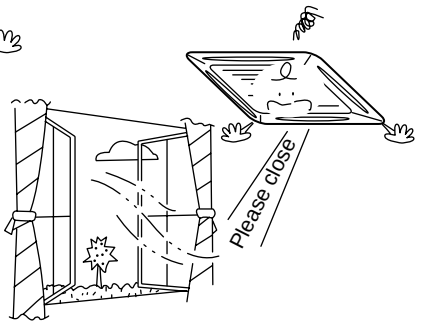
In heating, close the curtains to keep the heat in.

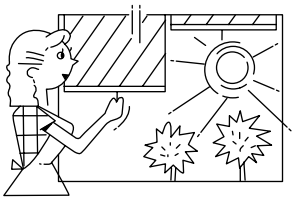
**Get uniform circulation of room air**

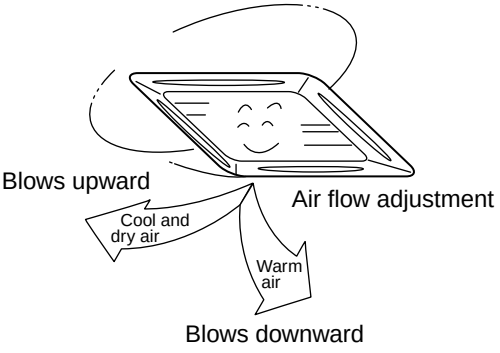
Adjust the air flow direction for the even circulation of room air.



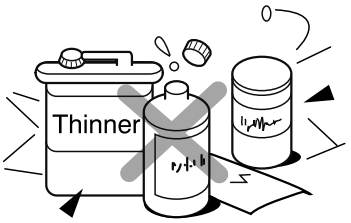


# MAINTENANCE

### Cleaning of remote controller

**CAUTION**

- Use a dry cloth to wipe the remote controller.
- A cloth dampened with cold water may be used on the indoor unit if it is very dirty.
- Never use a damp cloth on the remote controller.
- Do not use a chemically-treated duster for wiping or leave such materials on the unit for long. It may damage or fade the surface of the unit.
- Do not use benzine, thinner, polishing powder, or similar solvents for cleaning. These may cause the plastic surface to crack or deform.




### If you do not plan to use the unit for more than 1 month

(1) Operate the fan for 3 to 4 hours to dry inside the unit
   - Operate “FAN ONLY” mode with set temperature 30°C.

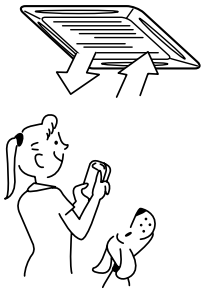
(2) Stop the air conditioner and turn off the main power switch or the circuit breaker.

### Checks before operation

(1) Check that the air filters are installed.

(2) Check that the air outlet or inlet is not blocked.

(3) Turn on the main power switch or the circuit breaker for the mains AC outlet to turn on the air conditioner.



**FAN ONLY operation or thermo.-off operation**

**WARNING**

Cleaning of the air filter and other parts of the air filter involves dangerous work in high places, so be sure to have a service person do it.

Do not attempt it yourself.

**NOTE**

For Air conditioning system which is operated regularly, cleaning and maintenance of the indoor/outdoor units are strongly recommended.
As a general rule, if an indoor unit is operated for about 8 hours daily, the indoor/outdoor units will need to be cleaned at least once every 3-MONTH. This cleaning and maintenance shall be carried out by a qualified person.
Failure to clean the indoor/outdoor units regularly will result in poor performance, icing, water leaking and even compressor failure.

# AIR CONDITIONER OPERATIONS AND PERFORMANCE

## 3 minutes protection function

3-minutes protection function prevents the air conditioner from starting for initial 3 minutes after the main power switch/circuit breaker is turned on for re-starting the air conditioner.

## Power failure

Power failure during operation will stop the unit completely.

- To restart the operation, push the START/STOP button on the remote controller.
- Lightning or a wireless car telephone operating nearby may cause the unit to malfunction. Turn off the main power switch or circuit breaker and then turn them on again. Push the START/STOP button on the remote controller to restart.

## Heating characteristics
## Preheating operation

The air conditioner will not deliver warm air immediately after it is turned on. Warm air will start to flow out after approximately 5 minutes when the indoor heat exchanger warmed up.

## Warm air control (In heating operation)

When the room temperature reaches the set temperature, the fan speed is automatically reduced to prevent to blow cold draft. At this time, the outdoor unit will stop.

## Defrosting operation

If the outdoor unit is frosted during the heating operation, defrosting starts automatically (for approximately 2 to 10 minutes) to maintain the heating capacity.

- The fans in both indoor and outdoor units will stop during the defrosting operation.
- During the defrosting operation, the defrosted water will be drained from the bottom plate of the outdoor unit.

## Heating capacity

In the heating operation, the heat is absorbed from the outside and brought into the room. This way of heating is called heat pump system. When the outside temperature is too low, it is recommended to use another heating apparatus in combination with the air conditioner.

## Attention to snowfall and freeze on the outdoor unit

- In snowy areas, the air inlet and air outlet of the outdoor unit are often covered with snow or frozen up. If snow or freeze on the outdoor unit is left as it is, it may cause machine failure or poor warming.
- In cold areas, pay attention to the drain hose so that it perfectly drains water without water remaining inside for freeze prevention. If water freezes in the drain hose or inside the outdoor unit, it may cause machine failure or poor warming.

## Air conditioner operating conditions

For proper performance, operate the air conditioner under the following temperature conditions:

| | | |
|---|---|---|
| Cooling operation | Outdoor temperature | : –5°C to 43°C |
| | Room temperature | : 21°C to 32°C (Dry valve temp.), 15°C to 24°C (Wet valve temp.) |
| | **CAUTION** | Room relative humidity – less than 80 %. If the air conditioner operates in excess of this figure, the surface of the air conditioner may cause dewing. |
| Dry operation | Outdoor temperature | : 15°C to 43°C (Maximum suction air temp. 46°C) |
| | Room temperature | : 17°C to 32°C |
| Heating operation | Outdoor temperature | : –15°C to 15°C (Wet valve temp.) |
| | Room temperature | : 15°C to 28°C (Dry valve temp.) |

If air conditioner is used outside of the above conditions, safety protection may work.

## RE-INSTALLATION

**DANGER**

**Ask the dealer or an installation professional to re-install the air conditioner to a new place or move it to another place and to observe the following items.**

**If the air conditioner is inappropriate installed by yourself, it may cause electric shock or fire.**

### Do not install the air conditioner in the following places

- Do not install the air conditioner in any place within 1 m from a TV, stereo, or radio set. If the unit is installed in such place, noise transmitted from the air conditioner affects the operation of these appliances.
- Do not install the air conditioner near a high frequency appliance (sewing machine or massager for business use, etc.), otherwise the air conditioner may malfunction.
- Do not install the air conditioner in a humid or oily place, or in a place where steam, soot, or corrosive gas is generated.
- Do not install the air conditioner in a salty place such as seaside area.
- Do not install the air conditioner in a place where a great deal of machine oil is used.
- Do not install the air conditioner in a place where it is usually exposed to strong wind such as in seaside area or on the roof or upper floor of a building.
- Do not install the air conditioner in a place where sulfureous gas generated such as in a spa.
- Do not install the air conditioner in a vessel or mobile crane.

### Be careful with noise or vibrations

- Do not install the air conditioner in a place where noise by outdoor unit or hot air from its air outlet annoys your neighbors.
- Install the air conditioner on a solid and stable foundation so that it prevents transmission of resonating, operation noise and vibration.
- If one indoor unit is operating, some sound may be audible from other indoor units that are not operating.

## TROUBLES AND CAUSES

**CAUTION**

If any of the following conditions occur, turn off the main power supply switch and immediately contact the dealer :

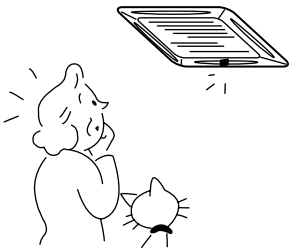
- The operation lamps flash at short intervals (5 Hz) even though you have tried turning off the power supply and turning on again after 2 or 3 minutes.
- Switch operation does not work properly.
- The main power fuse often blows out, or the circuit breaker is often activated.
- A foreign matter or water fall inside the air conditioner.
- Any other unusual conditions are observed.

**Before you ask for servicing or repairs, check the following points.**

**Recheck**

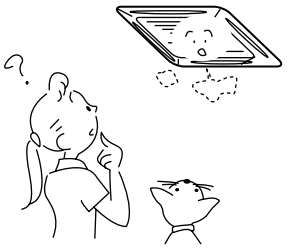
### Inoperative

- The main power switch is turned off.
- The circuit breaker is activated to cut off power supply.
- The main power fuse has blown out.
- Stoppage of electric current.



### Does not cool well or heat well

- The air inlet and/or outlet of the outdoor unit is blocked.
- Doors or windows are opened.
- The fan speed is set to low.
- The air conditioner is set in the DRY mode.
- The set temperature is too high. (In cooling operation)
- The set temperature is too low. (In heating operation)



**These are not failures.**

### Indoor unit or outdoor unit makes a strange noise.

- When the temperature suddenly changes, the indoor or outdoor unit occasionally makes a strange noise because of expansion/ contraction of parts or change of refrigerant flow.

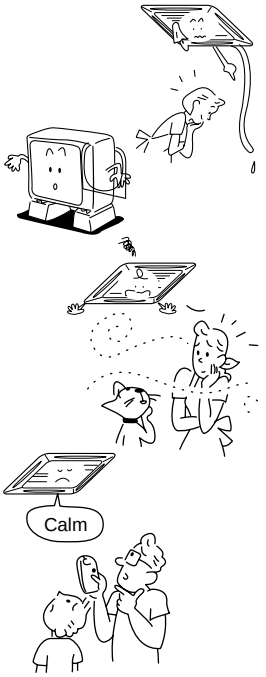
### The room air is smelly or a bad odor comes from the air conditioner.

- Smells impregnated in the walls, carpets, furniture, clothing, or furs, come out.

### Outdoor unit is frosted in heating operation. Water drains from outdoor unit.

- The outdoor unit is sometimes frosted in heating operation.

  In that case, the unit automatically performs defrosting (for 2 to 10 minutes) for increasing the heating efficiency.
- In defrosting operation, both the indoor and outdoor units stop air flow.
- Hiss sound is heard when flow of the refrigerant is changed for defrosting.
- Resultant water of automatic defrosting in heating operation drains from outdoor unit.

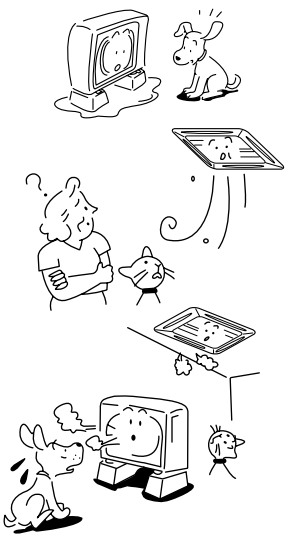



### Air flow changes though the FAN button is not set to the AUTO mode.

- When the temperature of blown air drops in heating operation, the air conditioner automatically changes or stops air flow from the indoor unit not to make persons in the room feel chilly.
- Air flow from the indoor unit is occasionally changed in the cooling operation.

### A white mist of chilled air or water is generated from the outdoor unit.

- The indoor unit in cooling operation or the outdoor unit in defrosting operation occasionally steams.



# Accessory parts and Parts to be procured locally

## ❒ Accessory parts

| Part name | Q'ty | Shape | Usage |
|---|---|---|---|
| Installation Manual | 1 | This manual | (Be sure to hand over to customers) |
| Heat insulating pipe | 2 | | For heat insulation of pipe connecting section |
| Installation pattern | 1 | —— | For confirmation of ceiling opening and main unit position |
| Installation gauge | 2 | | For positioning of ceiling position (united with installation pattern) |
| Pattern fixing screw | 4 | M5 x 16L | For attach the installation pattern |
| Heat insulator | 1 | | For heat insulation of drain connecting section |

| Part name | Q'ty | Shape | Usage |
|---|---|---|---|
| Washer | 8 | | For hanging-down unit |
| Hose band | 1 | | For connecting drain pipe |
| Flexible hose | 1 | | For adjusting core-out of drain pipe |
| Heat insulator | 1 | | For sealing of wire connecting port |
| Owner's Manual | 1 | | (Be sure to hand over to customers) |

### <Separate sold parts>

| Part name | Q'ty | Shape | Usage |
|---|---|---|---|
| Standard wired remote controller | 1 | | Model **RBC-AMT21E** |

| Part name | Q'ty | Shape | Usage |
|---|---|---|---|
| Ceiling panel | 1 | | Model **RBC-U21PG (W)-E** |

## ❒ Parts to be procured locally

| |
|---|
| Connecting pipe (Liquid side)<br>(6.35mm (diam.), Nominal (diam.) 1/4" thick 0.8mm)<br>RAV-SM560UT-E, RAV-SM560AT-E<br>(9.52mm (diam.), Nominal (diam.) 3/8" thick 0.8mm)<br>RAV-SM800UT-E, RAV-SM800AT-E |
| Connecting pipe (Gas side)<br>(12.7mm (diam.), Nominal (diam.) 1/2" thick 0.8mm)<br>RAV-SM560UT-E, RAV-SM560AT-E<br>(15.9mm (diam.), Nominal (diam.) 5/8" thick 1.0mm)<br>RAV-SM800UT-E, RAV-SM800AT-E |
| Power supply cord<br>2.5mm² (H07RN-F or 245IEC66) or 3.5mm² (AWG-12) |

| |
|---|
| Connecting cable (indoor and outdoor cable)<br>H07RN-F or 245IEC66 (1.5mm² or more) |
| Thermal insulation for refrigerant pipe<br>(10mm or more, thermal insulating foam polyethylene) |
| Thermal insulation for drain pipe<br>(10mm or more, foam polyethylene) |
| Drain pipe (Outer 26mm (diam.)) |
| Tapes |
| Grounding cable (2.0mm (diam.) or more) |

# 1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this “PRECAUTIONS FOR SAFETY” carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
  Follow the Owner’s Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner’s Manual.



**CAUTION** **New Refrigerant Air Conditioner Installation**

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

**CAUTION** **To Disconnect the Appliance from Main Power Supply.**

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

**The installation fuse (25A D type ) must be used for the power supply line of this conditioner.**

**⚠ WARNINGS**

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
  Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting cable correctly.**
  If the connecting cable is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous maller other than the specified refrigerant into the refrigeration cycle.**
  If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it resultingly causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
  Do not store it in a wet basement or expose to rain or water.

# 1 PRECAUTIONS FOR SAFETY



- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
  If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
  If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
  An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Conform to the regulations of the local electric company when wiring the power supply.**
  Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
  If a combustible gas leaks, and stays around the unit, a fire may occur.

# 2 SELECTION OF INSTALLATION PLACE

**⚠ WARNING**

- **Install the air conditioner at enough strong place to withstand the weight of the unit.**
  If the strength is not enough, the unit may fall down resulting in injury.
- **Install the air conditioner at a height 2.5m or more from the floor.**
  If you insert your hands or others directly into the unit while the air conditioner operates, it is dangerous because you may contact with revolving fan or active electricity.

**⚠ CAUTION**

- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
  If a combustible gas leaks and stays around the unit, a fire may occur.

**Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.**

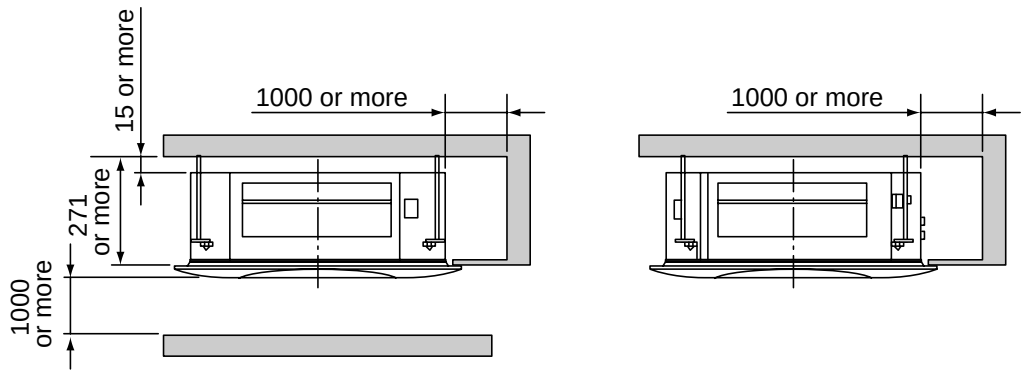
- Place where the unit can be installed horizontally.
- Place where a sufficient servicing space can be ensured for safety maintenance and check.
- Place where drained water will not cause any problem.

**Avoid installing in the following places.**

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- Place exposed to oil, vapor, oil smoke or corrosive gas.
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighboring house. (For outdoor unit)
- Place where noise of the outdoor unit is easily transmitted.
  (When installing the air conditioner on the boundary with the neighbor, pay due attention to the level of noise.)
- Place with poor ventilation. (Before air ducting work, check whether value of air volume, static pressure and duct resistance are correct.)

## Installation space

**Secure the specified space in the figure for installation and servicing.**



# 2 SELECTION OF INSTALLATION PLACE

## Selection of installation place

In case of continued operation of the indoor unit under high-humidity conditions as described below, dew may condense and water may drop.

Especially, high-humidity atmosphere (dew point temperature : 23°C or more) may generate dew inside the ceiling.

1. Unit is installed inside the ceiling with slated roof.
2. Unit is installed at a location using inside of the ceiling as fresh air take-in path.
3. Kitchen

If installing a unit at such place, put insulating material (glass wool, etc.) additionally on all the positions of the indoor unit which come to contact with high-humidity atmosphere.

## Advice

Set a check service opening panel at right side of the unit (size: 450 x 450mm or more) for piping, maintenance, and servicing.

## Ceiling height

| Model RAV- | Possible installe ceiling height |
|---|---|
| SM560UT-E, SM800UT-E | Up to 3.8m |

When the height of the ceiling exceeds the distance of the item Standard/4-way in Table below, the hot air is difficult to reach the floor. Therefore, it is necessary to change the setup value of the high ceiling switch or discharge direction.

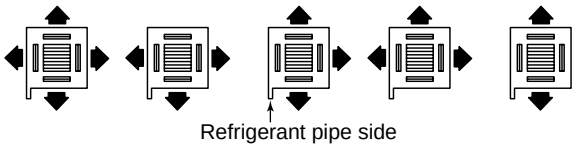
### REQUIREMENT

- When using the air conditioner with 2-way discharge system with the standard setting (at a shipment), it may stop abnormally in heating. Therefore, change the setting switch according to the number of discharge direction and the ceiling height.
- When using the air conditioner with 2-way/3-way discharge system, a strong wind blows directly if the ceiling height is lower than the standard. Therefore, change the setting switch according to height of the ceiling.
- When using the high ceiling (1) or (2) with 4-way discharge system, the draft is apt to be felt due to drop of the discharge temperature.

## Discharge direction

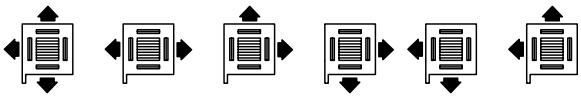
**As shown in the following figure, No. of discharge directions can be selected according to the shape of rooms and installation position.**

**RAV-SM560UT-E to RAV-SM800UT-E**

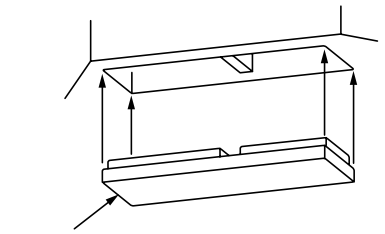



**As shown in the following figure direction are not acceptable.**

**RAV-SM560UT-E to RAV-SM800UT-E**



- To change discharge direction, use a shielding plate.
- When attaching a shielding plate, remove the ceiling panel and insert the shielding plate into the discharge port as shown in the figure below.




### ⚠ WARNING

Install the air conditioner certainly to sufficiently withstand the weight.

If the strength is insufficient, the unit may fall down resulting in human injury.

Perform a specified installation work to guard against an earthquake.

An incomplete installation can cause accidents by the units falling and dropping.

### Height list of ceiling possible to be installed

(Unit : m)

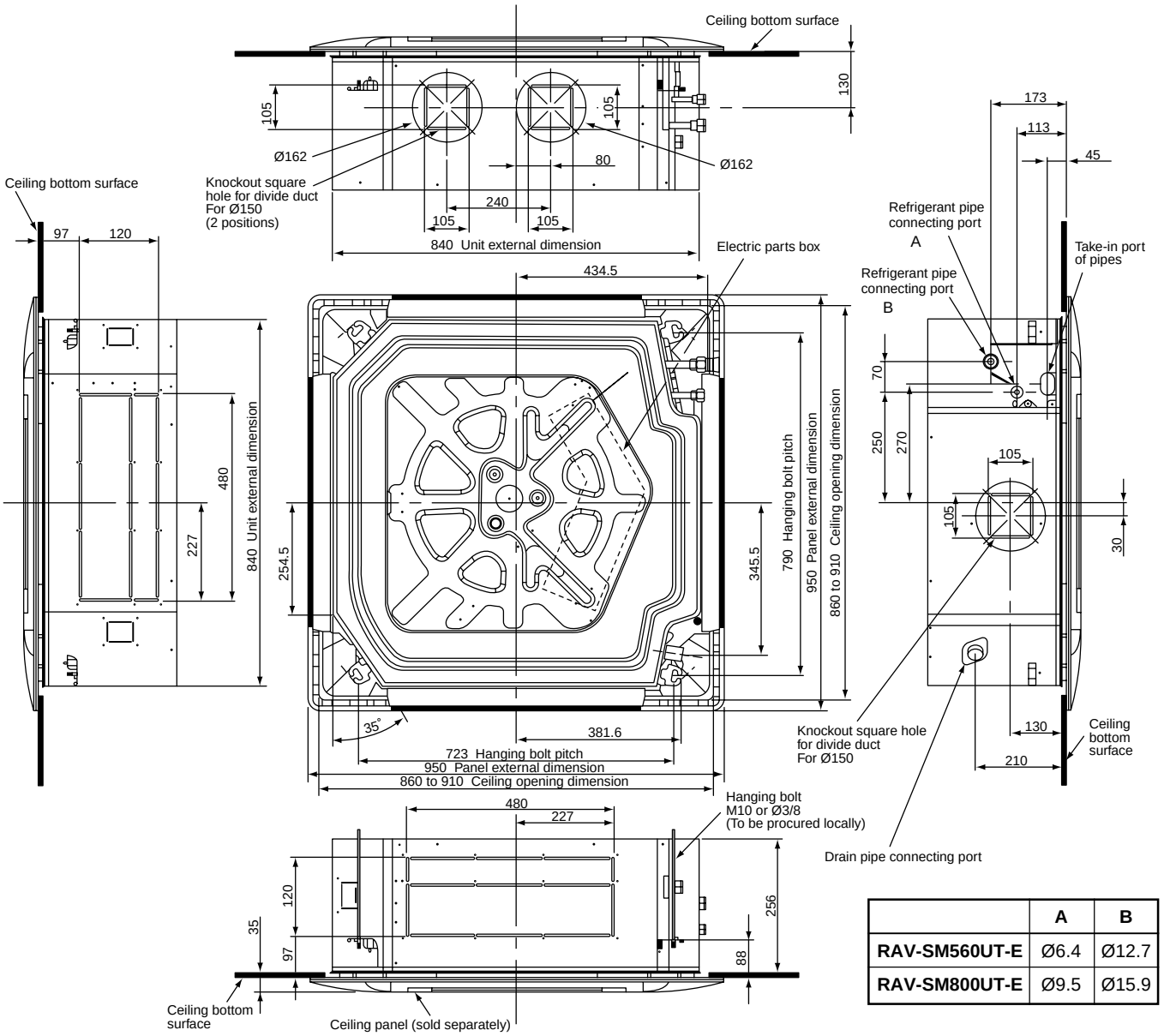
| Model | RAV-SM560UT-E | | | RAV-SM800UT-E | | | High ceiling setup |
|---|---|---|---|---|---|---|---|
| No. of discharge direction | 4-way | 3-way | 2-way | 4-way | 3-way | 2-way | Set data |
| Standard (at shipment) | 2.8 | 3.2 | 3.5 | 3.0 | 3.3 | 3.6 | 0000 |
| High ceiling (1) | 3.2 | 3.5 | 3.8 | 3.3 | 3.5 | 3.8 | 0001 |
| High ceiling (2) | 3.5 | 3.8 | — | 3.6 | 3.8 | — | 0003 |

## External view

**REQUIREMENT**

Strictly comply with the following rules to prevent damage of the indoor units and human injury.

- Do not put a heavy article on the indoor unit. (Even units are packaged)
- Carry in the indoor unit as it is packaged if possible. If carrying in the indoor unit unpacked by necessity, be sure to use buffering cloth, etc. to not damage the unit.
- To move the indoor unit, hold the hooking metals (4 positions) only.
  Do not apply force to the other parts (refrigerant pipe, drain pan, foamed parts, or resin parts, etc.).
- Carry the package by two or more persons, and do not bundle it with PP band at positions other than specified.




| | A | B |
|---|---|---|
| **RAV-SM560UT-E** | Ø6.4 | Ø12.7 |
| **RAV-SM800UT-E** | Ø9.5 | Ø15.9 |

Considering pipe/wire connecting work inside the ceiling after the indoor unit has been hanged, select an installation place and determine piping direction.

- If the ceiling has already been set before hanging the main unit, prepare refrigerant pipe, drain pipe, indoor connecting wire, remote controller cord, etc. up to the place where pipe and wire can be connected.
- Check the size of the indoor unit, and match the indoor unit size, with ceiling opening size and that position using the attached installation pattern.
  (Attach the pattern to the lower side of indoor unit with attached four screws M5 x 16L.)

# 2 SELECTION OF INSTALLATION PLACE

## Opening a ceiling and installation of hanging bolts

### <Treatment of ceiling>

The ceiling differs according to structure of building. For details, consult your constructor or interior finish contractor.

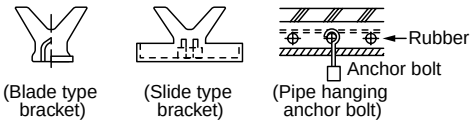
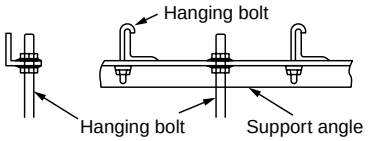
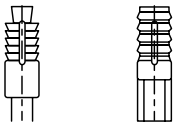
In the process after the ceiling board has been removed, it is important to reinforce ceiling foundation (frame) and to keep horizontal level of installed ceiling correctly in order to prevent vibration of ceiling board.

(1) Cut and remove the ceiling foundation.

(2) Reinforce the cut surface of ceiling foundation, and add ceiling foundation for fixing the end of ceiling board.

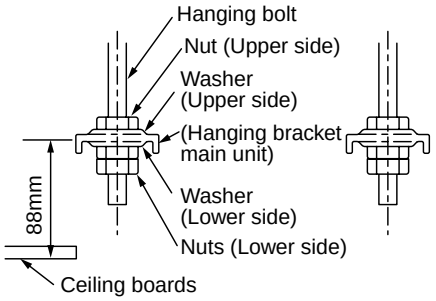
### <Installation of hanging bolt>

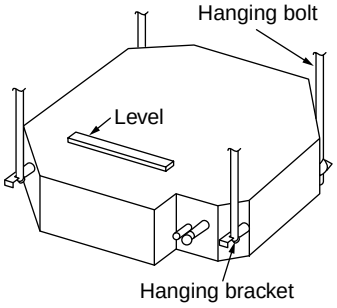
Use M10 hanging bolts (4 pcs, to be local procure). Matching to the existing structure, set pitch according to size in the unit external view as shown below.

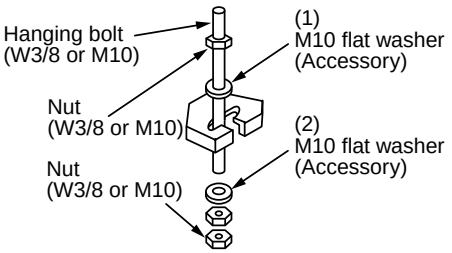
| New concrete slab | Steel flame structure | Existing concrete slab |
|---|---|---|
| Install the bolts with insert brackets or anchor bolts.<br>  <br> | Use existing angles or install new support angles.<br>  <br> | Use a hole-in anchors, hole-in plugs, or a hole-in bolts.<br>  |

## Installation of ceiling opening and hanging bolt

Adjust nut position (lower side) so that clearance between the attached washer (lower side) and ceiling board is 88mm.

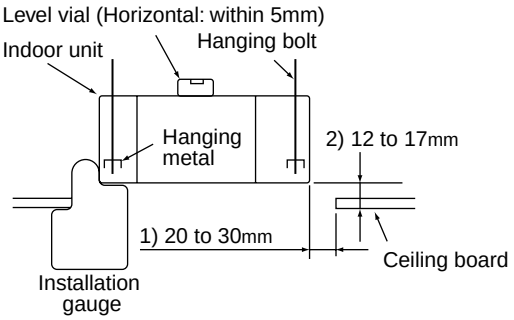


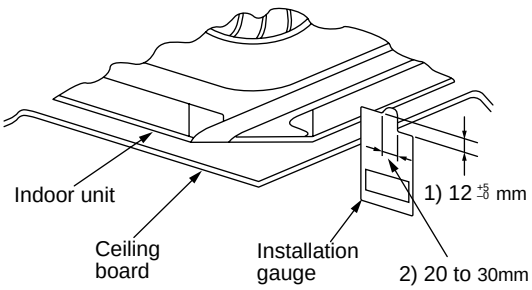




(1) Required those other than M10 flat washer at site.

(2) To prevent falling-off of bolt (safety), be sure to set it just under the hanging bracket as shown in the figure.

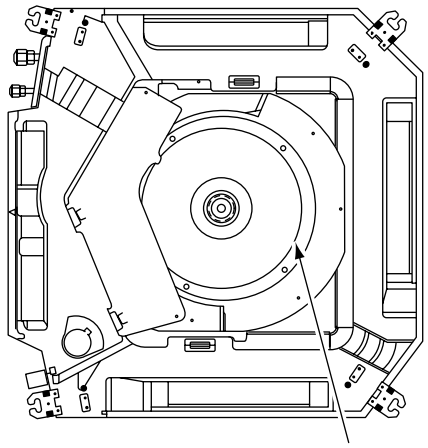



- Hang up the main unit by hanging the nut of hanging bolt to T groove of hanging bracket of the main unit.
- Using the level vial, etc., set the horizontal level of the main unit within 5mm.
- Using the installation gauge, check and adjust the positional relation between the main unit and ceiling opening hole, and hanging-up height of the main unit. (Direction to be used is indicated on the installation gauge.)
  1) Check lower side of the indoor unit locates at position (12 to 17) mm higher than the lower surface of the ceiling board. (4 corners)
  2) Check clearance between side of the indoor unit and the ceiling board is 20 to 30mm. (Common to 4 corners)



**REQUIREMENT**

Before installation of the indoor unit, be sure to remove the cushion for transportation between the fan and the bell mouth. Running the unit without removing the cushion may damage the fan motor.



Be sure to remove the cushion for transportation between the fan and the bell mouth.

## Installation of ceiling panel (Sold separately)

Install the ceiling panel according to Installation Manual attached with it after piping/wiring work has completed.

Check that installation of indoor unit and ceiling opening part is correct, and then install it.

**REQUIREMENT**

Joint the connecting sections of ceiling panel, ceiling surface, ceiling panel and indoor unit closely.

Any gap between them will cause air leakage and this generate condensation or water leakage.

## Installation of ceiling opening and hanging bolt

For installation of the wired remote controller, follow the Installation Manual attached with the remote controller.

- Pull out the remote controller cord together with the refrigerant pipe or drain pipe.
  Be sure to pass the remote controller cord through upper side of the refrigerant pipe and drain pipe.

# 3 DRAIN PIPING WORK

**⚠ CAUTION**

- **Following the Installation Manual, perform the drain piping work so that water is properly drained, and apply a heat insulation so as not to cause a dew. Inappropriate piping work may result in water leakage in the room and wet of furniture.**

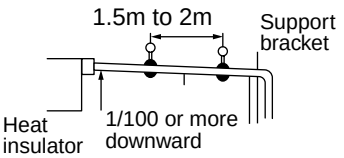
## Piping/Heat insulating material

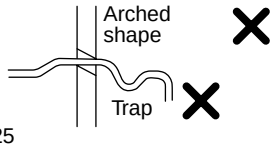
Require the following materials for piping and heat insulating at site.

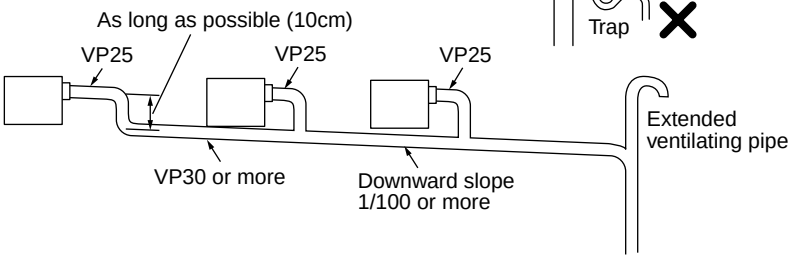
| | |
|---|---|
| **Piping** | Hard vinyl chloride pipe VP25 (Outer dia. : Ø32mm) |
| **Heat insulator** | Foam polyethylene : Thickness 10mm or more |

## REQUIREMENT

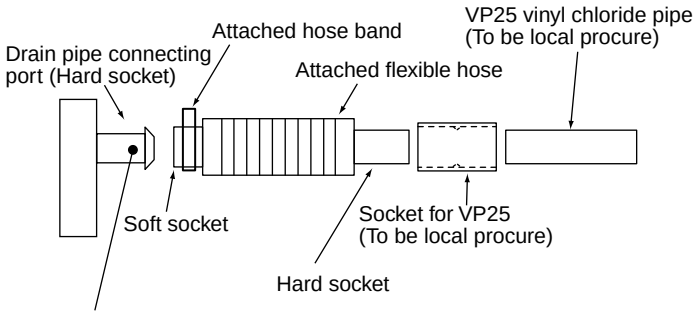
- Be sure to perform heat insulation of the drain pipes of the indoor unit.
- Never forget to perform heat insulation of the connecting part with the indoor unit. An incomplete heat insulation causes dewing.
- Set the drain pipe with downward slope (1/100 or more), and do not make swelling or trap on the piping. It may cause an abnormal sound.
- For length of the traversing drain pipe, restrict to 20m or less. In case of a long pipe, provide support brackets with interval of 1.5 to 2m in order to prevent waving.

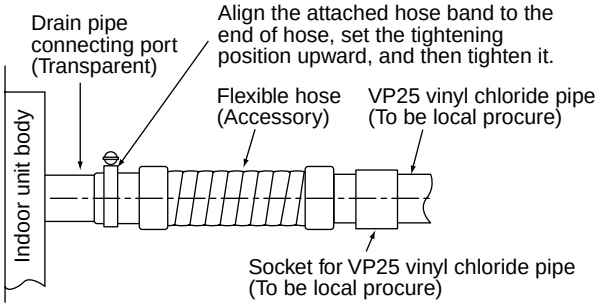



- Set the collective piping as shown in the right figure.
- Be sure not to apply force to the connecting part of the drain pipe.
- The hard vinyl-chloride pipe cannot be directly connected to the drain pipe connecting port of the indoor unit.
  For connection with the drain pipe connecting port, be sure to use/fix the attached flexible hose with the hose band, otherwise a damage or water leak is caused on the drain pipe connecting port.


Drain pipe connecting port (Hard socket)
Attached hose band
Attached flexible hose
VP25 vinyl chloride pipe (To be local procure)
Soft socket
Socket for VP25 (To be local procure)
Hard socket


Drain pipe connecting port (Transparent)
Align the attached hose band to the end of hose, set the tightening position upward, and then tighten it.
Flexible hose (Accessory)
VP25 vinyl chloride pipe (To be local procure)
Indoor unit body
Socket for VP25 vinyl chloride pipe (To be local procure)

**Adhesive inhibited :**

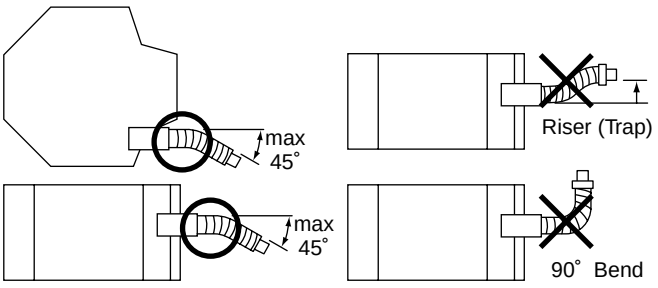
Use the attached flexible hose and hose band for connecting the drain hose to the clear drain socket.

If applying the adhesive, socket will be damaged and cause water leakage.

## Flexible hose

Use the attached flexible hose to adjust core discrepancy of the hard vinyl chloride pipe or to adjust the angle.

- Do not use the flexible hose as stretched, or do not deform it more extent than that in the following figure.
- Be sure to fix the soft end of the flexible hose with the attached hose band.
- Use the flexible hose on a horizontal level.



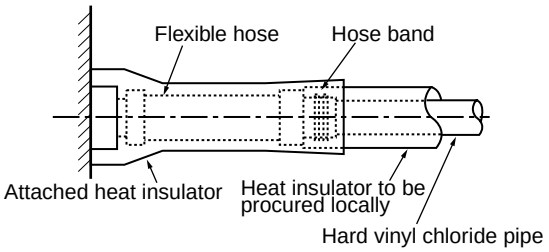
## Connection procedure

**Connect a socket and a hard vinyl chloride pipe.**

- Using adhesive agent for vinyl chloride pipe, connect the drain pipes certainly so that water does not leak.
- It takes approx. 10 hours to dry and harden the adhesive agent. During this period, do not apply force to the connecting part with the drain pipe.

### Perform heat insulating.

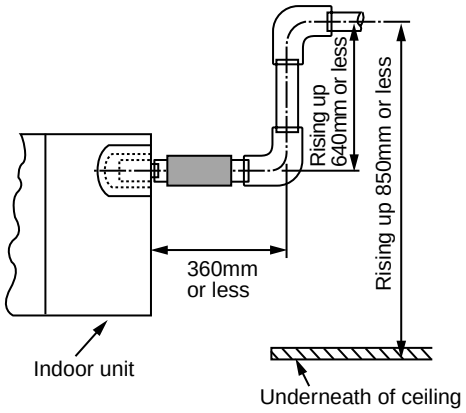
- As shown in the figure, cover the flexible hose and hose band with the attached heat insulator up to the bottom of the indoor unit without gap.




## Drain up

When a downward grading cannot be secured on the drain pipe, drain-up up to 640mm is possible.

Set downward grading immediately after raising up vertically.



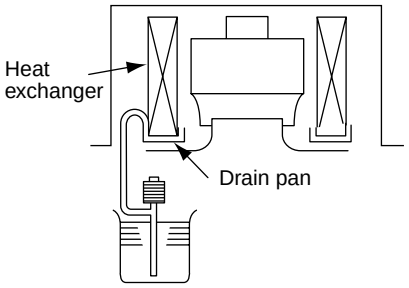

## Check the draining

In the test run, check that water drain is properly performed and water does not leak from the connecting part of the pipes.

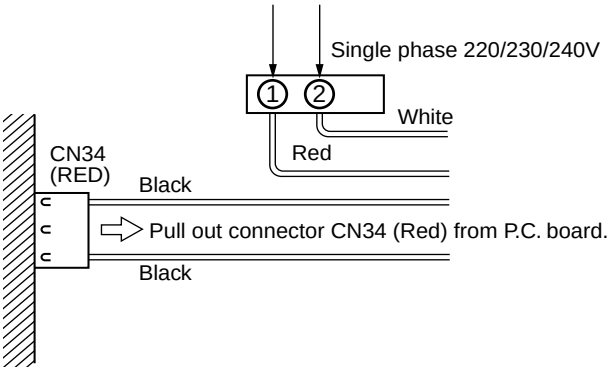
Be sure to check draining also when installed in heating period.

Using a pitcher or hose, pour water (1500 to 2000cc) into the discharge port before installation of the ceiling panel.

Pour water gradually so that water does not spread on the motor of the drain pump.




- After the electric work has finished, pour water during COOL mode operation.
- If the electric work has not yet finished, pull out the float switch connector (CN34 : Red) from the electric parts box, and check draining by plugging the single phase 220/230/240V power to the terminal blocks 1 and 2.
  If doing so, the drain pump motor operates.
- Test water drain while checking the operation sound of the drain pump motor.
  (If the operation sound changes from continuous sound to intermittent sound, water is normally drained.)
  After the check, the drain pump motor runs, connecting the float switch connector.
  (In case of check by pulling out the float switch connector, be sure to return the connector to the original position.)



# 4 REFRIGERANT PIPING

## Refrigerant Piping

1. If the outdoor units are to be mounted on a wall, make sure that the supporting platform is sufficiently strong. The platform should be designed and manufactured to maintain its strength over a long period of time, and sufficient consideration should be given to ensuring that the outdoor unit will not fall.
2. **Use copper pipe with 0.8 mm or more thickness.**
3. Flare nut and flare works are also different from those of the conventional refrigerant. Take out the flare nut attached to the main unit of the air conditioner, and use it.

**CAUTION**

**IMPORTANT 4 POINTS FOR PIPING WORK**

1. Remove dust and moisture from the inside of the connecting pipes.
2. Tight connection (between pipes and unit)
3. Evacuate the air in the connecting pipes using VACUUM PUMP.
4. Check the gas leakage. (Connected points)

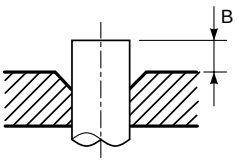
## Permissible Piping Length and Heat

| The maximum piping length from the outdoor to indoor unit | |
|---|---|
| 30 m (Chargeless 20m) (RAV-SM560AT-E) | 50 m (Chargeless 20m) (RAV-SM800AT-E) |
| **The maximum height difference outdoor/indoor unit** | |
| **Outdoor unit is above** | **Outdoor unit is below** |
| 30m | 15m |

## Flaring

Insert a flare nut into the pipe, and flare the pipe.

As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended. However, the conventional tools can be used by adjusting projection margin of the copper pipe.




- **Projection margin in flaring : B (Unit : mm)**

Rigid (Clutch type)

| Outer diam. of copper pipe | R410A tool used | | Conventional tool used | |
|---|---|---|---|---|
| | **R410A** | R22 | **R410A** | R22 |
| 6.35 to 9.52 | 0 to 0.5 | (Same as left) | 1.0 to 1.5 | 0.5 to 1.0 |

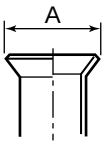
Imperial (Wing nut type)

| Outer diam. of copper pipe | R410A | R22 |
|---|---|---|
| 6.35 or 9.52 | 1.5 to 2.0 | 1.0 to 1.5 |
| 12.7 or 15.9 | 2.0 to 2.5 | 1.5 to 2.0 |

- **Flaring dia meter size : A (Unit : mm)**

| Outer diam. of copper pipe | $A^{+0}_{-0.4}$ | |
|---|---|---|
| | **R410A** | R22 |
| 6.35 | 9.1 | 9.0 |
| 9.52 | 13.2 | 13.0 |
| 12.7 | 16.6 | 16.2 |
| 15.9 | 19.7 | 19.2 |

* In case of flaring for R410A with the conventional flare tool, pull it out approx. 0.5 mm more than that for R22 to adjust to the specified flare size. The copper pipe gauge is useful for adjusting projection margin size.




## Tightening connection

**CAUTION**

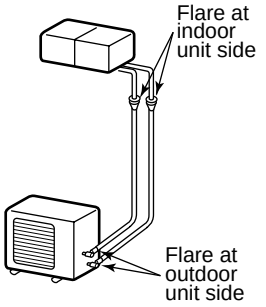
- Do not apply excessive torque. Otherwise, the nut may crack depending on the conditions.

(Unit : N•m)

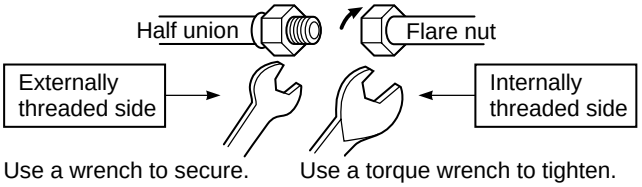
| Outer diam. of copper pipe | Tightening torque |
|---|---|
| 6.35 mm (diam.) | 14 to 18 (1.4 to 1.8 kgf•m) |
| 9.52 mm (diam.) | 33 to 42 (3.3 to 4.2 kgf•m) |
| 12.7 mm (diam.) | 50 to 62 (5.0 to 6.2 kgf•m) |
| 15.9 mm (diam.) | 63 to 77 (6.3 to 7.7 kgf•m) |

- **Tightening torque of flare pipe connections**

Pressure of R410A is higher than that of R22. (Approx. 1.6 times) Therefore, using a torque wrench, tighten the flare pipe connecting sections which connect the indoor and outdoor units of the specified tightening torque. Incorrect connections may cause not only a gas leak, but also a trouble of the refrigeration cycle.




Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. Then tighten the nut with a spanner and torque wrench as shown in the figure.



# 5 EVACUATING

**AIR PURGE**

Evacuate the air in the connecting pipes and in the indoor unit using vacuum pump.
Do not use the refrigerant in the outdoor unit.
For details, see the manual of vacuum pump.

## Use a vacuum pump

Be sure to use a vacuum pump with counter-flow prevention function so that inside oil of the pump does not flow backward into pipes of the air conditioner when the pump stops.

1. Connect the charge hose from the manifold valve to the service port of the gas side packed valve.
2. Connect the charge hose to the port of vacuum pump.
3. Open fully the low pressure side handle of the gauge manifold valve.
4. Operate the vacuum pump to start evacuating.

   Perform evacuating for about 35 minutes if the piping length is 30 meters total for model SM560 and 50 meters for model SM800
   (assuming a pump capacity of 27 liters per minute.)
   Then confirm that the compound pressure gauge reading is –101 kPa ( –76 cmHg).
5. Close the low pressure side valve handle of gauge manifold.
6. Open fully the valve stem of the packed valves (both sides of Gas and Liquid).
7. Remove the charging hose from the service port.
8. Securely tighten the caps on the packed valves.

**REQUIREMENT**

For the tools such as charge hose, etc., use those manufactured exclusively for R410A.

## Refrigerant amount to be added

For addition of the refrigerant, add refrigerant “R410A” referring to the attached Installation Manual.

Be sure to use a scale to charge the refrigerant of specified amount.

**REQUIREMENT**

- Charging an excessive or too little amount of refrigerant causes a trouble of the compressor. Be sure to charge the refrigerant of specified amount.
- A personnel who charged the refrigerant should write down the pipe length and the added refrigerant amount in the nameplate attached to the service panel of the outdoor unit. It is necessary to troubleshoot the compressor and refrigeration cycle malfunction.

## Open the valve fully

Open the valve of the outdoor unit fully. A 4mm-hexagonal wrench is required for opening the valve.

## Gas leak check

Check with a leak detector or soap water whether gas leaks or not, from the pipe connecting section or cap of the valve.

**REQUIREMENT**

Use a leak detector manufactured exclusively for HFC refrigerant (R410A, R134a, etc.).

## Thermal insulation process

Apply thermal insulation for the pipes separately at liquid side and gas side.

For the thermal insulation to the pipes at gas side, be sure to use the material with heat-resisting temperature 120°C or higher.

Using the attached thermal insulation material, apply the thermal insulation to the pipe connecting section of the indoor unit securely without gap.

**REQUIREMENT**

Apply the thermal insulation to the pipe connecting section of the indoor unit securely up to the root without exposure of the pipe. (The pipe exposed to the outside causes water leak.)

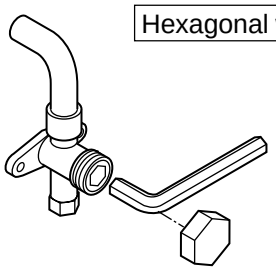
# 5 EVACUATING

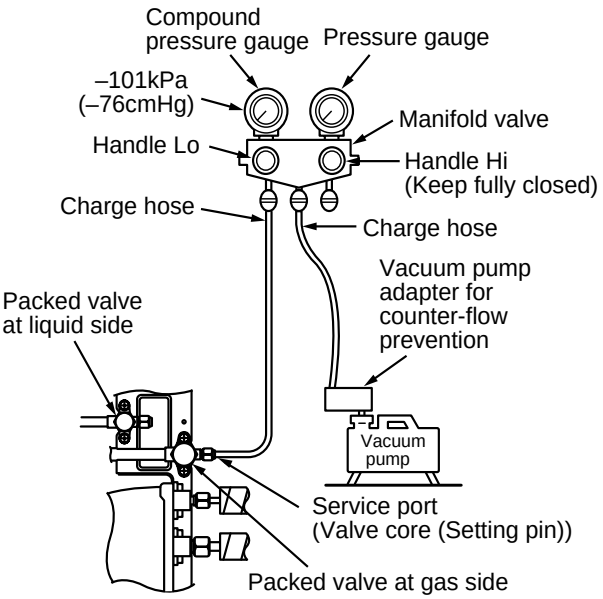
## Packed valve handling precautions

- Open the valve stem all the way out ; do not try to open it beyond the stopper.
- Securely tighten the valve stem cap at the torque as follows:

| | |
|---|---|
| Gas side (15.9 mm (diam.)) | 63 to 77 N•m (6.3 to 7.7 kgf•m) |
| Gas side (12.7 mm (diam.)) | 50 to 62 N•m (5.0 to 6.2 kgf•m) |
| Gas side (9.52 mm (diam.)) | 33 to 42 N•m (3.3 to 4.2 kgf•m) |
| Liquid side (6.35 mm (diam.)) | 14 to 18 N•m (1.4 to 1.8 kgf•m) |
| Service port | 14 to 18 N•m (1.4 to 1.8 kgf•m) |

Hexagonal wrench is required.

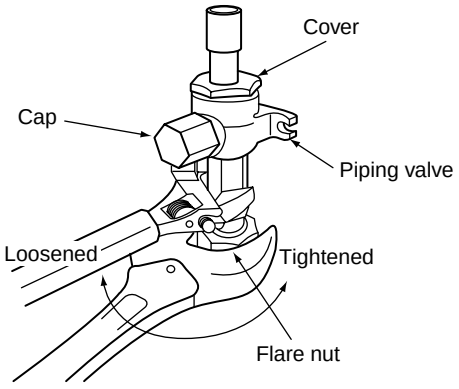




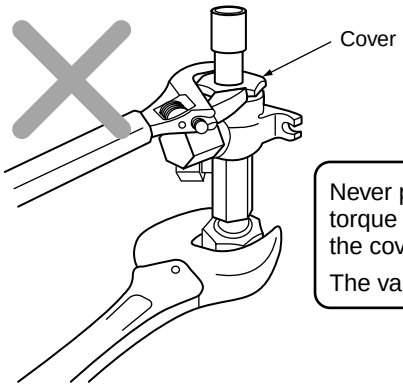

### <For RAV-SM800AT-E model>

- As shown in the figure, be sure to use a double spanner to loosen or tighten the flare nut of the valve at gas side. If using a single spanner, the nut cannot be tightened with necessary tightening torque.

  On the contrary, use a single spanner to loosen or tighten the flare nut of the valve at liquid side.




**SM800 type valve at gas side**




Never put the spanner or torque wrench, etc. on the cover.

The valve may be broken.

# 6 ELECTRICAL WORK

## ⚠ WARNING

**1. Using the specified cables, ensure to connect the wires, and fix wires securely so that the external tension to the cables do not affect the connecting part of the terminals.**

Incomplete connection or fixation may cause a fire, etc.

**2. Be sure to connect earth wire. (Grounding work)**

Do not connect the earth wire to gas pipe, city water pipe, lightning rod, or the earth wire of telephone. Incomplete grounding causes an electric shock.

**3. For electric work, strictly follow the Local Regulation in each country and the Installation Manual, and use an exclusive circuit.**

Capacity shortage of power circuit or incomplete installation may cause an electric shock or a fire.

## CAUTIONS

- This indoor unit has no power cord.
- If incorrect/incomplete wiring is carried out, it will cause an electrical fire or smoke.
- Be sure to install an earth leakage breaker that is not tripped by shock waves.
  If an earth leakage breaker is not installed, an electric shock may be caused.
- Be sure to use the cord clamps attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting cables when peeling them.
- Be sure to comply with local regulations on running the wire from outdoor unit to indoor unit (size of wire and wiring method etc.)
- Use the power cord and Inter-connecting cable of specified thickness, type, and protective devices required.

## REQUIREMENT

- For power supply wiring, strictly conform to the Local Regulation in each country.
- For wiring of power supply of the outdoor units, follow the Installation Manual of each outdoor unit.
- Never connect 220/230/240V power to the terminal blocks (A, B, etc.) for control wiring. (Otherwise, the system will fail.)
- Perform the electric wiring so that it does not come to contact with the high-temperature part of the pipe. The coating may melt resulting in an accident.
- After connecting cables to the terminal blocks, provide a trap and fix cables with the cable clamp.
- Run the refrigerant piping line and control wiring line in the same line.
- Do not turn on the power of the indoor unit until vacuuming of the refrigerant pipes completes.

### Remote controller wiring

2-core non polarity cable is used for the remote controller wiring.

### How to wire

1. Connect the connecting cable to the terminal as identified with their respective numbers on the terminal block of indoor and outdoor unit. H07 RN-F or 245 IEC 66 (1.5 $mm^2$ or more)
2. Insulate the unsheathed redundant cords (conductors) with electrical insulation tape.
   Process them so that they do not touch any electrical or metal parts.
3. For inter-unit wiring, do not use a wire jointed to another on the way.

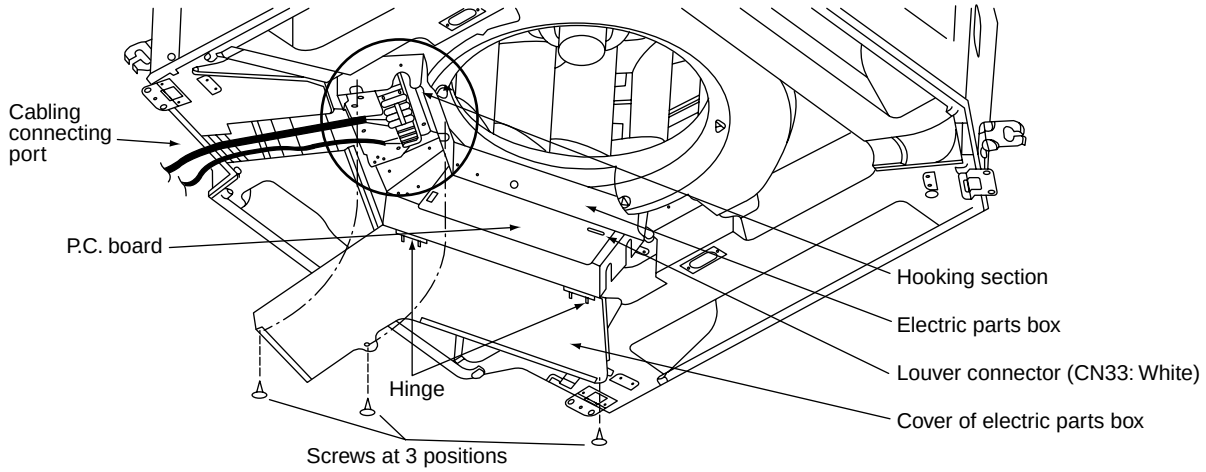
# 6 ELECTRICAL WORK

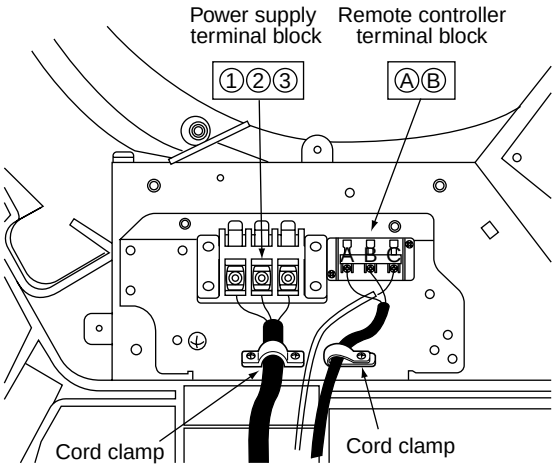
## Cable connection

**REQUIREMENT**

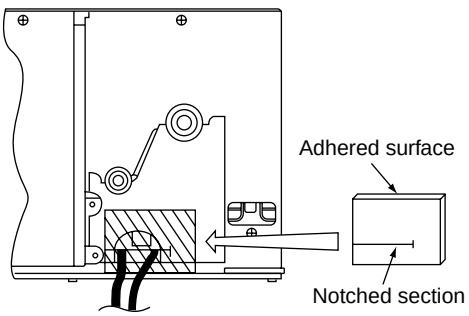
- Be sure to connect the cables matching the terminal numbers. Incorrect connection causes a trouble.
- Be sure to pass the cables through the bushing of cabling connection port of the indoor unit.
- Keep a margin (Approx. 100mm) on a cable to hang down the electric parts box at servicing, etc.
- The low-voltage circuit is provided for the remote controller. (Do not connect the high-voltage circuit)

- Remove the cover of the electric parts box by taking off the mounting screws (3 positions) and pushing the hooking section. (The cover of the electric parts box remains hanged to the hinge.)
- Connect the indoor/outdoor connection cables and REMOCON cable to the terminal block of the electric parts box. (Do not apply tension to the connecting section of the terminal block.)
- Tighten the screws of the terminal block, and fix the cables with cord clamp attached to the electric parts box. (Do not apply tension to the connecting section of the terminal block.)
- Using the attached thermal insulation material, seal the pipe connecting port. Otherwise, dewing may be caused.
- Mount the cover of the electric parts box without pinching cables.
  (Mount the cover after cabling on the ceiling panel.)




**<Thermal insulation to cabling connecting port>**



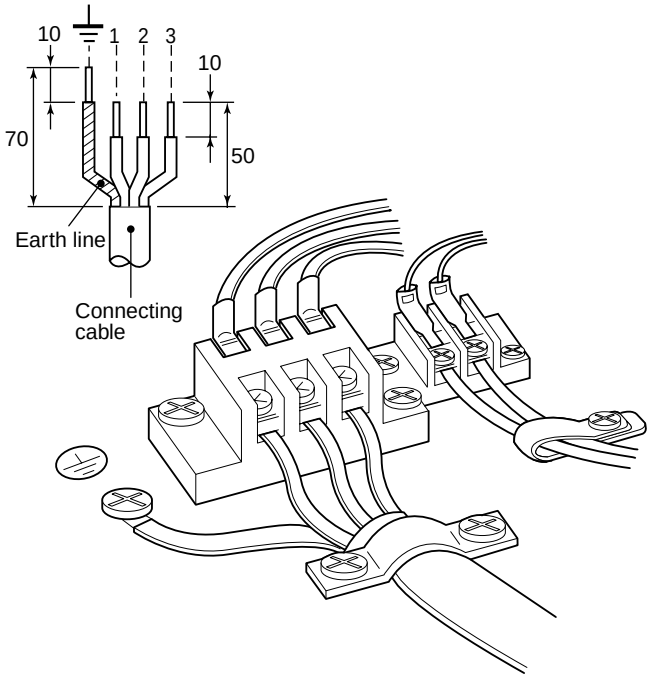

## Cabling on the ceiling panel

According to the Installation Manual of the ceiling panel, connect the connector (5P: White) of the ceiling panel to the connector (CN33: White) on P.C. board of the electric parts box.

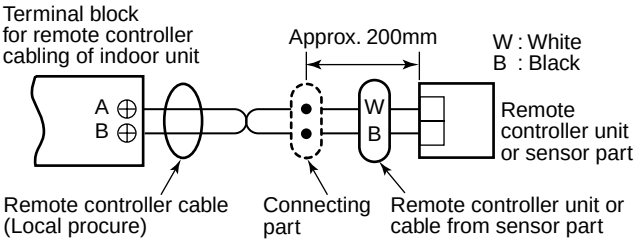
## Cabling

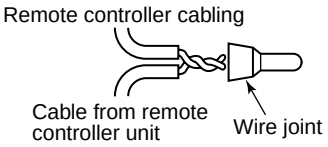
1. Remove a screw and then remove cover of the electric parts box.
2. Strip wire ends (10 mm).
3. Match wire colors with terminal numbers on indoor and outdoor units' terminal blocks and firmly screw wires to the corresponding terminals.
4. Connect the ground wires to the corresponding terminals.
5. Fix the cable with cord clamp.
6. Fix cover of the parts box and the terminal block surely with the fixing screws.

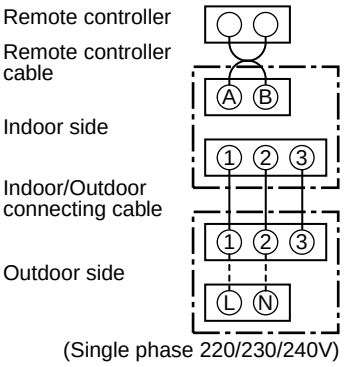
Make a loop on the cable for margin of the length so that the electric parts box can be taken out during servicing.




## Cabling diagram




- For details of cabling/installation of the remote controller, refer to the Installation Manual attached to in the remote controller.

## Remote Controller Cabling

- Strip off approx. 14mm the cable to be connected.
- Non polarity, 2 core cable is used for cabling of the remote controller.
- Twist cable of the remote controller to be connected with cable of the remote controller unit (or sensor), and press-fit them with a wire joint.
  Wire joints (White: 2 pieces) are included in the attachments to the remote controller (sold separately) or the wireless remote controller kit (sold separately).

# 7 TEST RUN

## Before test run

- Before turning on the power supply, carry out the following procedure.
  1) Using 500V-megger, check 1MΩ or more exists between the terminal block 1 to 3 and the earth.
     If 1MΩ or less is detected, do not run the unit. Do not apply to the remote controller circuit.
  2) Check the valve of the outdoor unit being opened fully.
- To protect the compressor at activation time, leave power-ON for 12 hours or more be for operating.

## How to execute a test run

Using the remote controller, operate the unit as usual.
For the procedure of the operation, refer to the attached Owner's Manual.

A forced test run can be executed in the following procedure if the operation stops by thermo.-OFF.

In order to prevent a serial operation, the forced test run is released after 60 minutes have passed and returns to the usual operation.

**CAUTION**

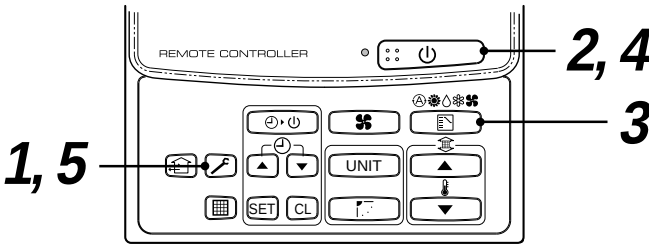
When the remote controller is used for the first time, it accepts an operation approx. 5 minutes after the power supply has been turned on.

It is not a trouble, but is because the setup of the remote controller is being checked.

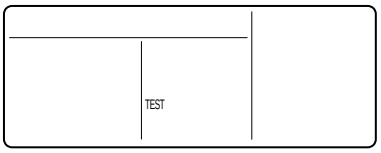
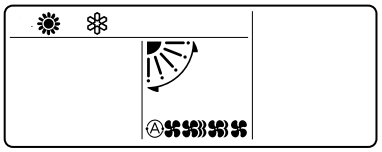
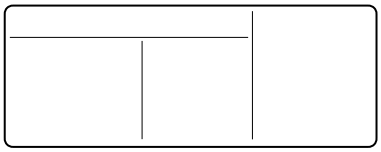
For the second power-ON time and after, approx. 1 munute is required to start the operation by the remote controller.

**NOTE**

Do not use the forced test run for cases other than the test run because it applies an excessive load to the devices.




### In case of wired remote controller

| Procedure | Description | |
|---|---|---|
| ***1*** | Keep [🔧] button pushed for 4 seconds or more. [TEST] is displayed on the display part and the selection of mode in the test mode is permitted. |   |
| ***2*** | Push [⏻] button. | |
| ***3*** | Using [▤] button, select the operation mode, [COOL] or [HEAT].<br>• Do not run the air conditioner in a mode other than [COOL] or [HEAT].<br>• The temperature controlling function does not work during test run.<br>• The detection of error is performed as usual. |  |
| ***4*** | After the test run, push [⏻] button to stop a test run.<br>(Display part is same as procedure ***1***. | |
| ***5*** | Push [🔧] check button to cancel (release from) the test run mode.<br>([TEST] disappears on the display and the status returns to a normal.) |  |

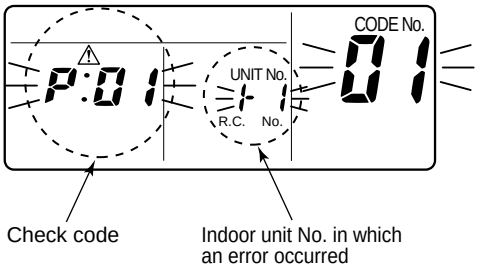
# 8 TROUBLESHOOTING

## Confirmation and check

When a trouble occurred in the air conditioner, the check code and the indoor unit No. appear on the display part of the remote controller.

The check code is only displayed during the operation.

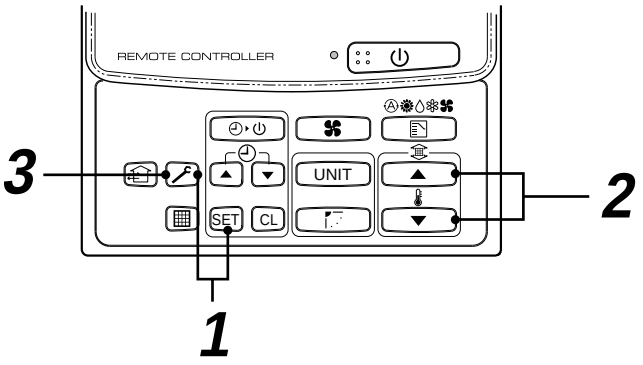
If the display disappears, operate the air conditioner according to the following “Confirmation of error history” for confirmation.

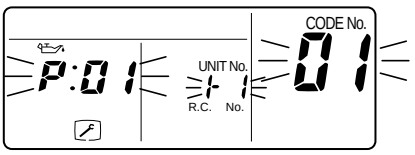



## Confirmation of error history

When a trouble occurred on the air conditioner, the trouble history can be confirmed with the following procedure. (The trouble history is stored in memory up to 4 troubles.)

The history can be confirmed from both operating status and stop status.




| Procedure | Description | |
|---|---|---|
| *1* | When pushing [SET] and [🔧] buttons at the same time for 4 seconds or more, the following display appears.<br>If [Service check] is displayed, the mode enters in the trouble history mode.<br>• [01 : Order of trouble history] is displayed in CODE No. window.<br>• [Check code] is displayed in CHECK window.<br>• [Indoor unit address in which an error occurred] is displayed in UNIT No. |  |
| *2* | Every pushing of [ ▲ , ▼ ] button used to set temperature, the trouble history stored in memory is displayed in order.<br>The numbers in CODE No. indicate CODE No. [01] (latest) → [04] (oldest).<br>**REQUIREMENT**<br>Do not push [CL] button because all the trouble history of the indoor unit will be deleted. | |
| *3* | After confirmation, push [🔧] button to return to the usual display. | |

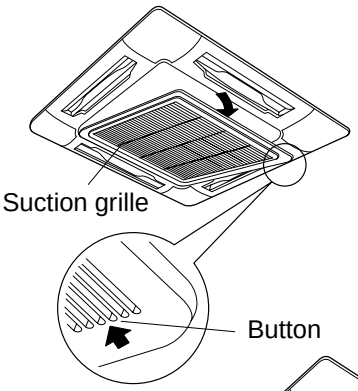
1. Check the troubles according to the above procedure.
2. Ask an authorized dealer or qualified service (maintenance) professional to repair or maintain the air conditioner.
3. More details of the service code are explained in Service Manual.

# 9 MAINTENANCE

**Before maintenance, be sure to turn off the leakage breaker.**

**Cleaning of air filter**

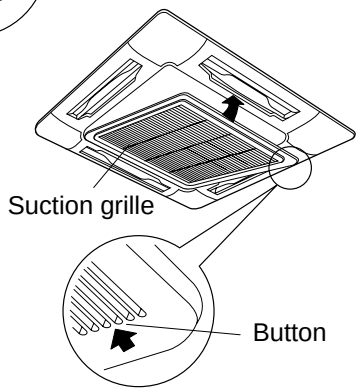
- If is displayed on the remote controller, maintain the air filter.
- Clogging of the air filter reduce cooling/heating performance.




### Cleaning of panel and air filter

**Preparation :**

1. Turn off the air conditioner by the remote controller.
2. Open the suction air port.
   - Slide the button of the suction air port inward, and open the suction port slowly while holding it.




### Clean the panel and air filter with water:

- Wipe down the panel and air filter with a sponge or towel moistened with a kitchen detergent. (Do not use any metallic brush for cleaning.)
- **Carefully rinse the panel and air filter to wash out the detergent.**
- **After rinsing the panel and air filter with water, dry it in the shade.**

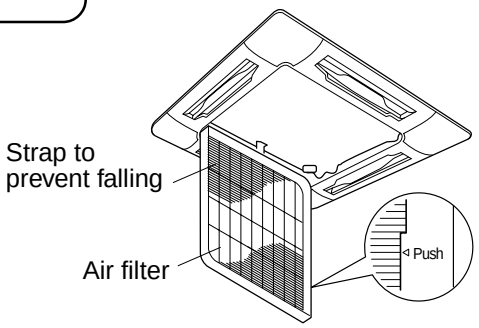
3. Close the suction air port.
   - Close the suction air port, slide the button outward, and fix the suction port securely.

**CAUTION**

- Do not start the air conditioner while leaving the panel and air filter removed.
- Push the filter reset button. ( indication will be turn off.)

### Cleaning of Air Filters

- If the air filters are not cleaned, it not only reduce the cooling a performance of air conditioner but causes a failure in the air conditioner such as water falling in drops.




**Preparation :**

1. Stop the operation by remote controller.
2. Dismount the air filter.

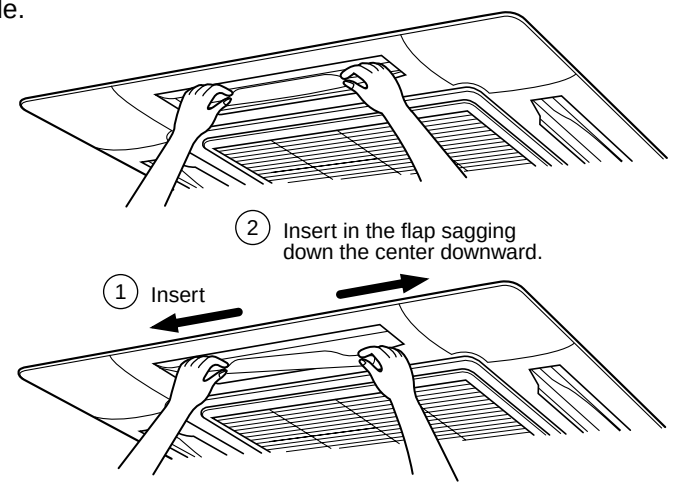
**Use a vacuum cleaner to remove dust from the filters or wash them with water.**

- After rinsing the air filters with water, dry them in the shade.
- Set the air filter into the air conditioner.

### Cleaning of discharge flap

The discharge flap can be removed to clean.

1. Remove the discharge flap.
   - Holding the both ends of the discharge flap, remove the flap sagging the center downward.
2. Cleaning with water
   - If the dirt is terrible, clean the flap by tepid water with neutral detergent or water.
3. Mount the discharge flap.
   - First push in one side of the flap, and then insert the other side sagging the center downward.

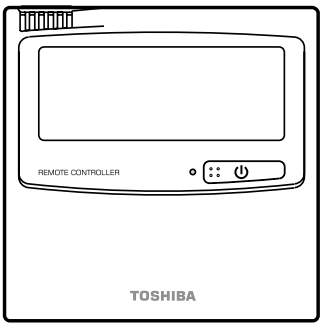



**Be careful to the direction of the flap when mounting.**

Mount the flap so that the side with the mark faces upward and the arrow direction of the mark directs.

# ACCESSORIES (SOLD SEPARATELY)

**Remote controller**



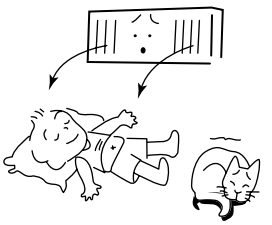

# PRECAUTIONS FOR SAFETY

## WARNING ⚠

### WARNINGS ABOUT INSTALLATION

- Make sure to ask the qualified installation professional in electric work to install the air conditioner.
  If the air conditioner is inappropriate installed by yourself, it may cause water leak, electric shock, fire, and so on.
- Be sure to provide grounding.
  Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone cables.

### CAUTION

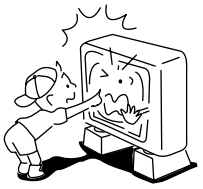


TO DISCONNECT THE APPLIANCE FROM THE MAINS SUPPLY

This appliance must be connected to the mains by means of a switch with a contact separation of at least 3 mm.

**The installation fuse (25A D type ) must be used for the power supply line of this conditioner.**

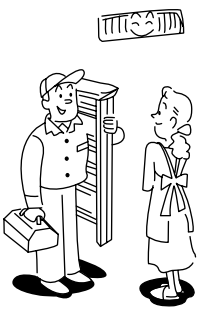
### WARNINGS ABOUT OPERATION



- Cleaning of the air filter and other parts of the air filter involves dangerous work in high places, so be sure to have a service person do it. Do not attempt it yourself. The cleaning diagram for the air filter is there for the service person, and not for the customer.
- Avoid cooling the room too strong or exposing the human body to cool breeze for a long time as it is bad for the health.

- When you notice something abnormal with the air conditioner (smells like something scorching, poor cooling, etc.), immediately turn off the main switch, the circuit breaker, from the mains to stop the air conditioner, and contact the dealer. If the air conditioner is continuously operated with something abnormal, it may cause machine failure, electric shock, fire, and so on.

### WARNINGS ABOUT MOVEMENT AND REPAIR

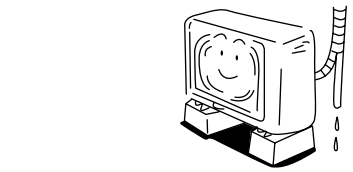


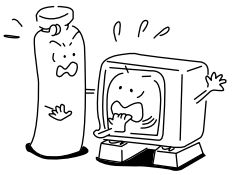
- Do not move or repair any unit by yourself.
  Since there is high voltage inside the unit, you may get electric shock when removing the cover and main unit.
- Whenever the air conditioner needs repair, make sure to ask the dealer to do it. If it is repaired imperfectly, it may cause electric shock or fire.
- When moving the air conditioner for re-installing at another place, ask the dealer to do it. If it is imperfectly installed, it may cause electric shock or fire.

## CAUTION

### CAUTIONS ABOUT INSTALLATION

- Be sure to confirm the following cautions.
- Certainly lay the drain hose for perfect draining.
  Bad drainage may cause flooding in the house and getting furniture wet.
- Make sure to connect the air conditioner to an exclusive power supply of the rated voltage, otherwise the unit may break down or cause a fire.
- Do not install the unit in a place where inflammable gas may leak.
  If inflammable gas accumulates around the unit, it may cause a fire.

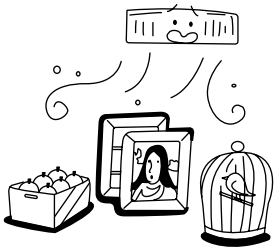


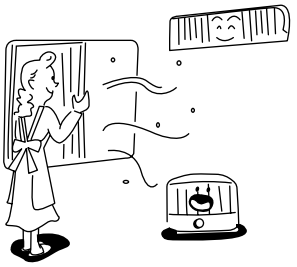


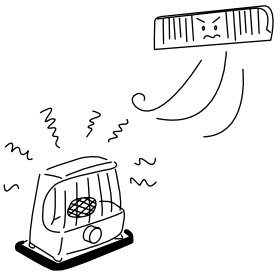
### CAUTIONS ABOUT OPERATION

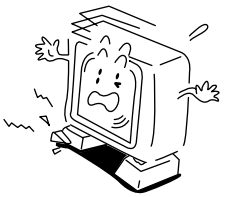
- Carefully read this manual before starting the air conditioner. There are many important things to keep in mind for daily operation.
- Do not use this air conditioner for special purposes such as preserving food, precision instruments, art objects, breeding animals, growing potted plants, etc.
- Avoid exposing potted plants and animals to the wind of the air conditioner, since it badly affects the health and growth of them.
- When the air conditioner is operated with a combustion appliance in the same place, be careful of ventilation to let fresh air enter the room.
  Poor ventilation causes oxygen shortage.
- Do not place any combustion appliance in a place where it is directly exposed to the wind of air conditioner, otherwise it may cause imperfect combustion.
- When the air conditioner is used in a closed room, be careful of sufficient ventilation of the room. Poor ventilation causes oxygen shortage.
- Do not touch any switches with wet finger, otherwise you may get an electric shock.
- If the air conditioner won't be used for a considerably long time, turn off the main switch or the circuit breaker, for safety.
- Check the concrete blocks, etc. of the base of the outdoor unit occasionally.

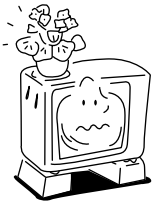
  If the base is left damaged or deteriorated, the unit may topple over and inflict an injury to a person as the worst case.
- Do not put anything on the outdoor unit nor step onto it. If you do so, it may not only topple over the unit but also injure yourself.
- To make the air conditioner operate in its original performance, operate it within the range of the operating temperature specified in the instructions.
  Otherwise it may cause a malfunction, or water leak from the unit.
- Prevent any liquid from falling into the remote controller. Do not spill juice, water or any kind of liquid.

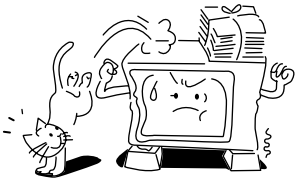








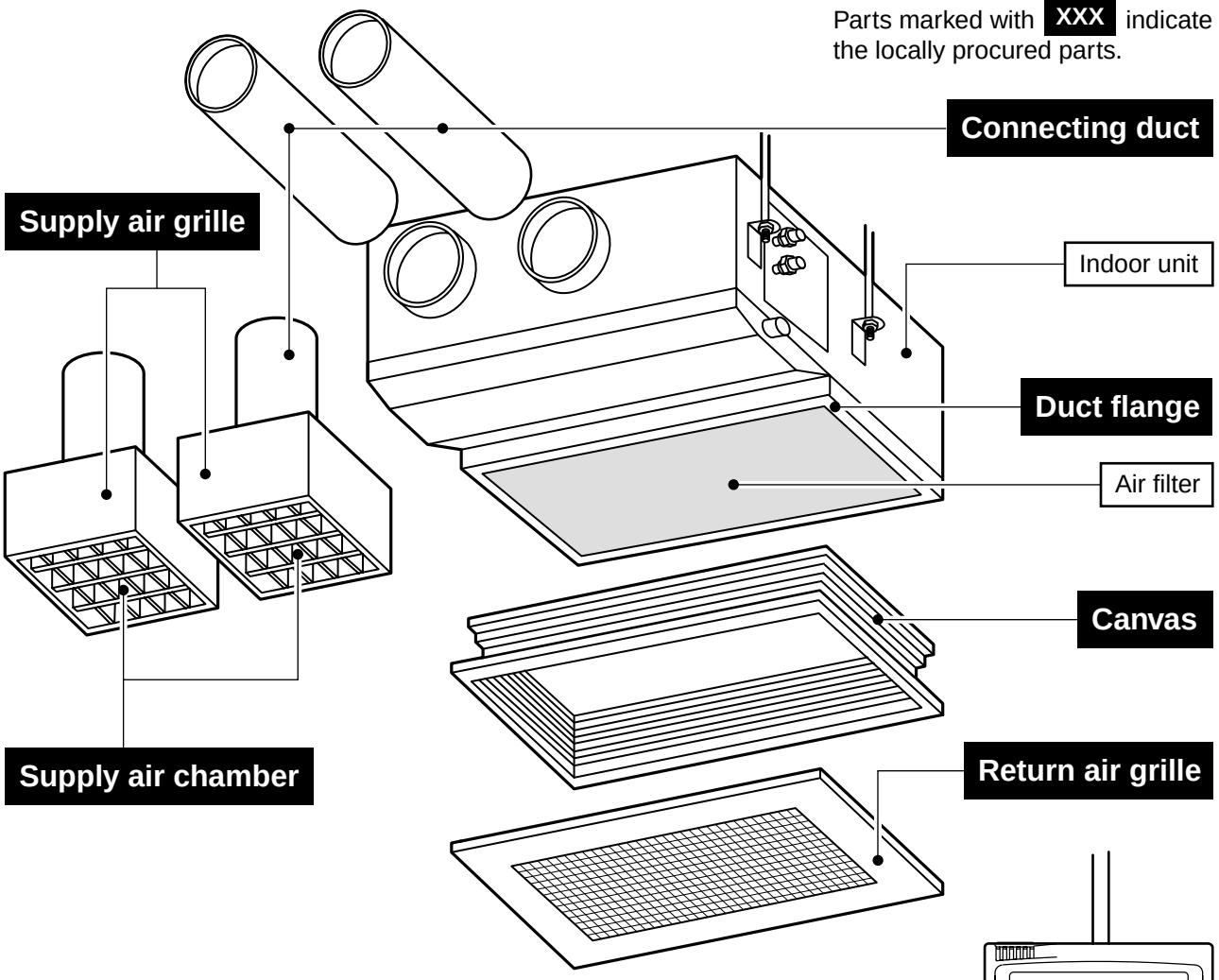


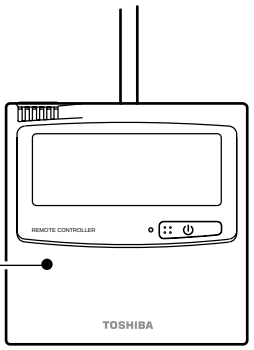


# PARTS NAME

## Indoor unit

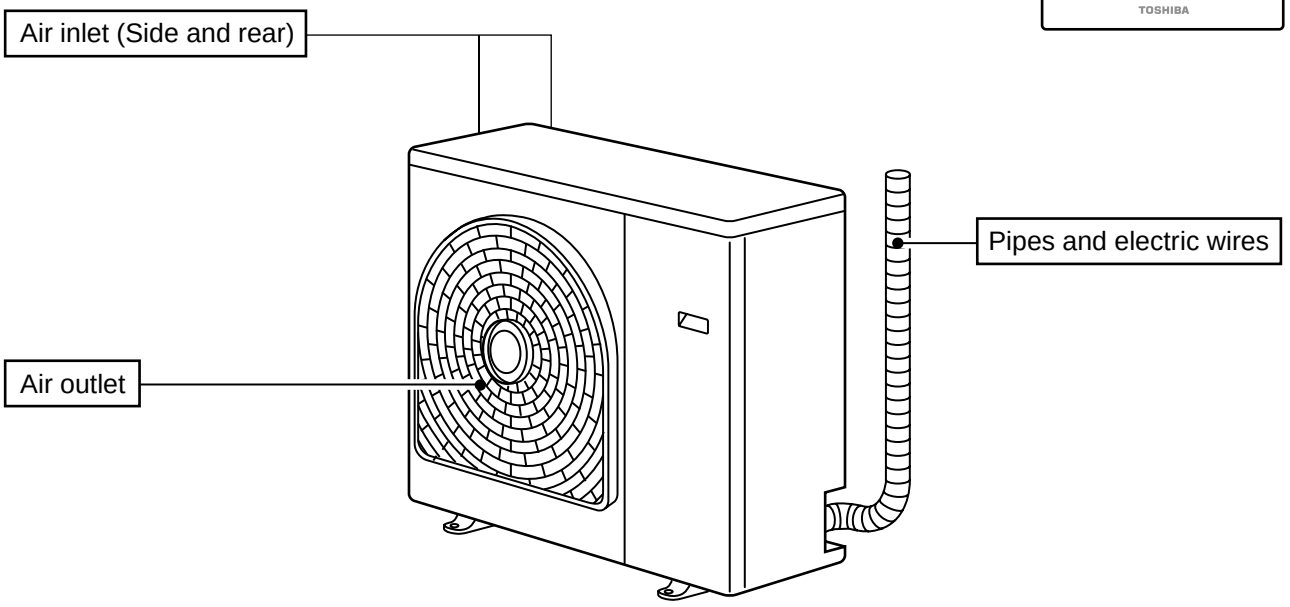
**NOTE :**
Parts marked with **XXX** indicate the locally procured parts.




Remote controller

## Outdoor unit



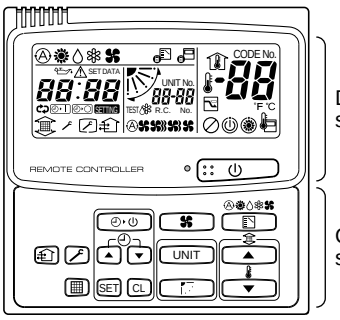
# PARTS NAME OF REMOTE CONTROLLER

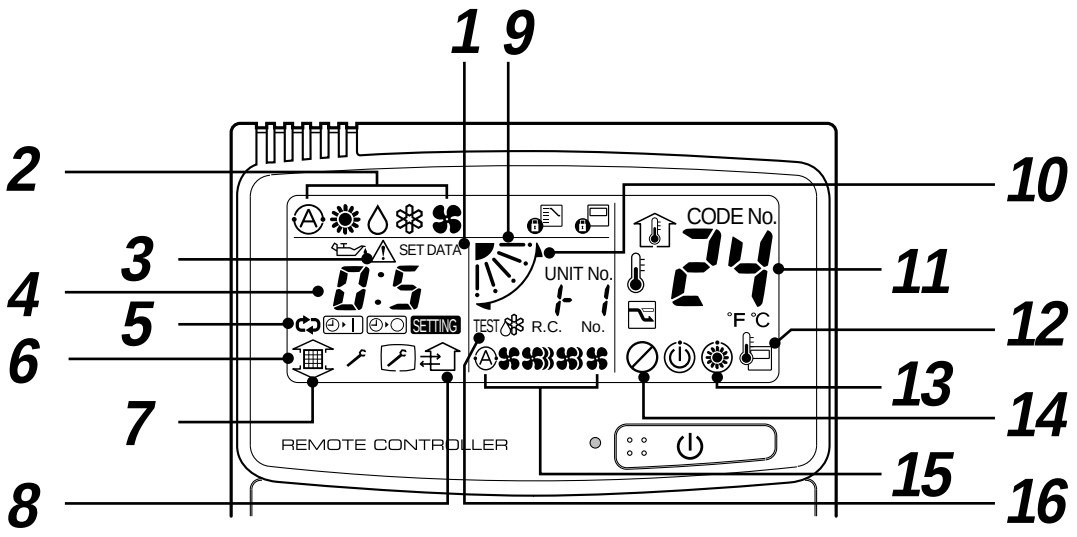
## Display section

All display items are shown in right figure for the explanation.

Only selected contents are displayed in actual operation.

- When turning on the leakage breaker at the first time, [**SET DATA]** flashes on the display part of the remote controller. While this display is flashing, the model is being automatically confirmed. Accordingly, wait for a while after [**SET DATA]** display has disappeared, and then use the remote controller.




***1*** **SET DATA display**
Displayed during setup a timer.

***2*** **Operation mode display**
The selected operation mode is displayed.

***3*** **CHECK display**
Displayed while the protective device works or a trouble occurs.

***4*** **Timer time display**
Set time by the timer is displayed.
(When a trouble occurs, the check code is displayed.)

***5*** **Timer SETIN setup display**
When pushing the Timer SET button, the display of the timer is selected in order of
[OFF] → [OFF] repeat OFF timer → [ON]
→ No display.

***6*** **Filter display**
If "FILTER" is displayed, clean the air filter.

***7*** **UP/DOWN grille display**

***8*** **Ventilator operation display**

***9*** **Flap position display**

***10*** **SWING display**
Displayed during up/down movement of the flap.

***11*** **Set up temperature display**
The selected set up temp. is displayed.

***12*** **Remote controller sensor display**
Displayed while the sensor of the remote controller is working.

***13*** **PRE-HEAT display**
Displayed when the heating operation starts or defrost operation is carried out.
While this indication is displayed, the indoor fan stops or the mode changes in LOW.

***14*** **No function display**
Displayed if there is no function even if the button is pushed.

***15*** **Fan mode display**
The selected fan mode is displayed.

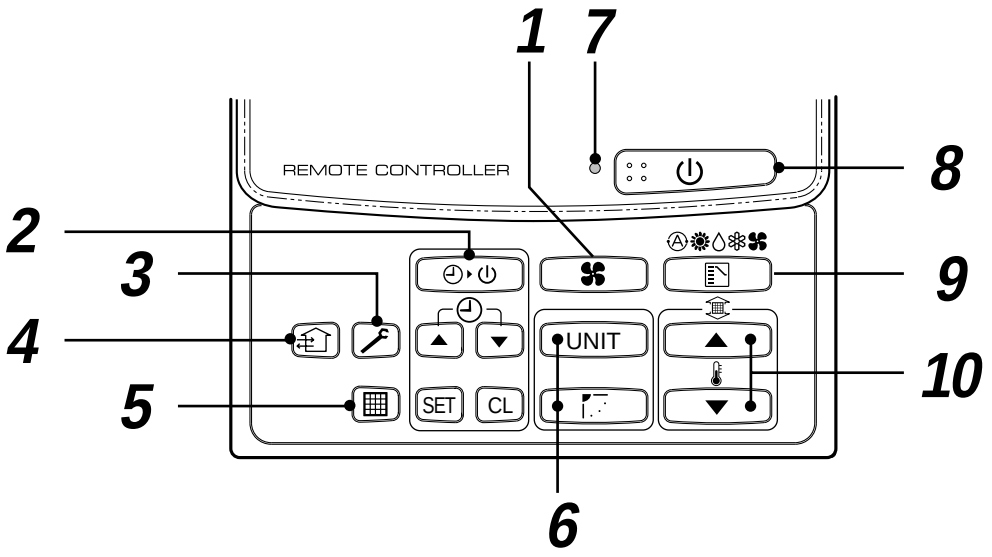
(AUTO)
(HIGH)
(MED.)
(LOW)

***16*** **TEST run display**
Displayed during a test run.

## Operation section

Push each button to select a desired operation.

- The details of the operation needs to be set up once, the same states are used by pushing ( ) button.




**1** **Fan mode button**

Selects a fan mode.

**2** **Timer set button**

TIMER SET button is used when the timer is set up.

**3** **Check button**

CHECK button is used for check operation. During normal operation, do not use this button.

**4** **Fan button**

FAN button is used when a fan which is sold on the market or etc. is connected.

- If “No function” is displayed on the remote controller when pushing the FAN button, a fan is not connected.

**5** **Filter reset button**

Resets (Erases) “FILTER ( )” display.

**6** **UNIT and AUTO flap button**

No function

**7** **Operation lamp**

Lamp is lit during the operation. Lamp is off when stopped.

It flashes when operating a protection device or abnormal occurred.

**8** ( ) **button**

When the button is pushed, operation starts, and it stops by pushing the button again.

When the operation stops, the operation lamp and all displays disappear.

**9** **Operation select button**

Selects operation mode.

**10** **Set up temperature button**

Adjusts required room temperature.

Set required set temperature by pushing ( ) or ( ).

**FILTER UP/DOWN button**

(No function display)

**OPTION :**

**Remote controller sensor**

Usually the TEMP. sensor of the indoor unit measures a temperature. A temperature around the remote controller can also be measured.

For details, contact the dealer from which you have purchased the air conditioner.

# CORRECT USAGE

When you use the air conditioner for the first time or when you change SET DATA value, follow the procedure below. From the next time, the operation will start as set state by pushing the button.

## Preparation

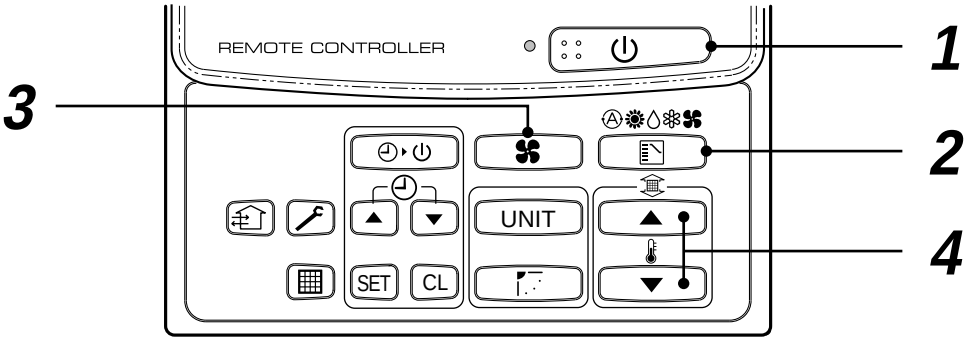
**Turn on the main power switch and/or the leakage breaker.**

- When the power supply is turned on, display section is displayed on the remote controller.

* After the power supply is turned on, the remote controller does not accept an operation for approx. 1 minute, but it is not a failure.

**REQUIREMENT**

- While using the air conditioner, operate it only with button without turning off the main power switch and the leakage breaker.
- When starting the operation after stop for a long time, turn on the main power switch for 12 hours or more before start. (This is required to turn on the compressor case heater for warming in order to prevent overload on the compressor when activating the outdoor unit.)

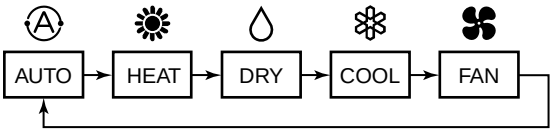



**1** **Push button.**

The operation lamp goes on, and the operation starts.

**2** **Select an operation mode with the "MODE" button.**

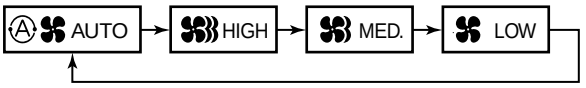
One push of the button, in each time the display changes in the order shown on the right.




- In HEAT mode, if the room temperature reaches to the set temperature, the outdoor unit stops and the air flow becomes LOW and the air volume decreases.
- In the defrost mode, the fan stops so that cool air is not discharged and PRE-DEF is displayed.

**3** **Select air volume with "FAN" button.**

One push of the button, in each time the display changes in the order shown on the right.




- When air volume is "AUTO", air volume differs according to the room temperature.
- In DRY mode, "AUTO" is displayed and the air volume is LOW.
- In heating operation, if the room temperature is not heated sufficiently with fan mode "LOW" operation, select "MED." or "HIGH" operation.

**4** **Determine the set up temperature by pushing the "TEMP." button or "TEMP." button.**

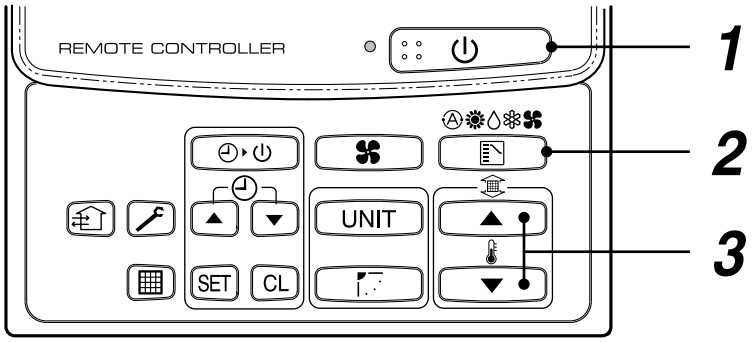
## Stop

**Push button.**

The operation lamp goes off, and the operation stops.

## AUTOMATIC OPERATION (Auto Changeover)

When you set the air conditioner in Ⓐ mode or switch over from AUTO operation, it will automatically select either cooling, heating, or fan only operation depending on the indoor room temperature.




### Start

***1*** **button**

Push this button to start the air conditioner.

***2*** **Mode select button (MODE)**

Select Auto.

***3*** **Temperature button**

Set the desired temperature.

- In case of cooling, start the operation after approx. 1 minute.
- In case of heating, starts the operation after approximately 3 to 5 minutes.
- When you select the Auto mode, it is unnecessary to set the fan speed.
  The fan speed display will show Ⓐ and fan speed will be automatically controlled.
- After heating operation stops, FAN operation may continue for approx. 30 seconds.
- When the room temperature reaches the set temperature and the outdoor unit stops, the LOW wind is discharged and the air volume decreases excessively. During defrost operation, the fan stops so that cool air is not discharged and ✺ is displayed.
- If the Auto mode is uncomfortable, you can select the desired conditions manually.

**NOTE**

**When restarting the operation after stop**

- When restarting the operation immediately after stop, the air conditioner does not operate for approx. 3 minutes to protect a compressor.

### Stop

**Push button.**

Push this button again to stop the air conditioner.

# TIMER OPERATION

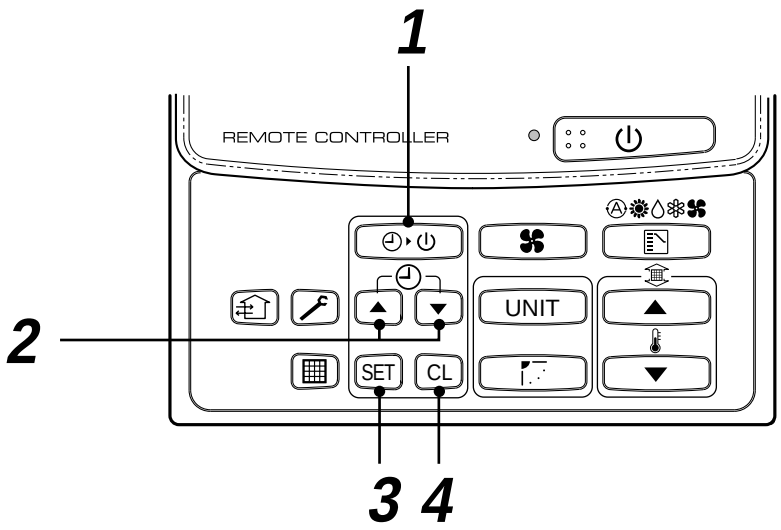
A type of timer operation can be selected from the following three types.

OFF timer : The operation stops after the set time has passed.

Repeat OFF timer : Every time, the operation stops after the set time has passed.

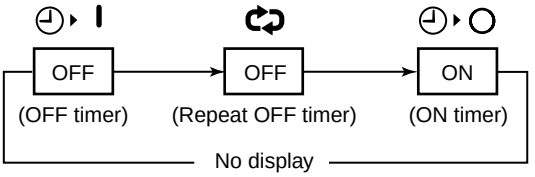
ON timer : The operation starts after the set time has passed.

## Timer operation




**1** **Push TIMER SET button.**

- The timer display (type) changes every push of the button.
- SET TIME and ⏲▸◯, ⏲, ⏻, 🔁 display flashes.




**2** **Push ▲ ▼ to select "SET TIME".**

For every push of ▲ button, the set time increases in the unit of 0.5 hr (30 minutes).
The maximum set time is 72.0 hr.
For every push of ▼ button, the set time decreases in the unit of 0.5 hr (30 minutes).
The minimum set time is 0.5 hr.

**3** **Push SET button.**

- SET TIME display disappears and timer time display goes on.

  (When ON timer is activated, timer time are displayed, ON timer ⏲▸| and SETTING other displays are disappear.)

## Clear of timer operation

**4** **Push CL button.**

- TIMER display disappears.

**NOTICE**

- Once set "Repeat OFF timer" resumes. So start again, stop by same timer.
  For cancel timer, push CL button..

## HINTS FOR ECONOMICAL OPERATION

**Maintain room temperature at comfortable level**
**Clean air filters**

Airflow and performance are reduced if the air filters become blocked.

**Do not open doors and windows more often than necessary**

To keep cool or warm air in the room, do not open doors and windows more often than necessary.

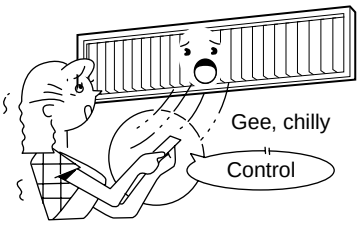
**Window curtains**

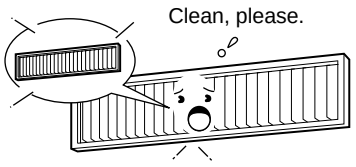
In cooling, close the curtains to avoid direct sunlight.

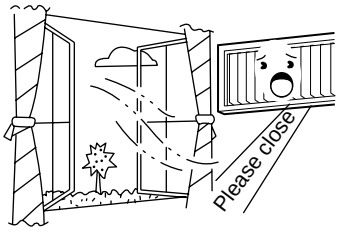
In heating, close the curtains to keep the heat in.

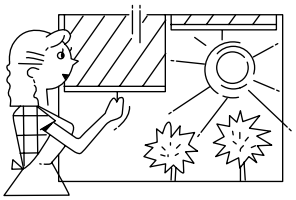
**Get uniform circulation of room air**

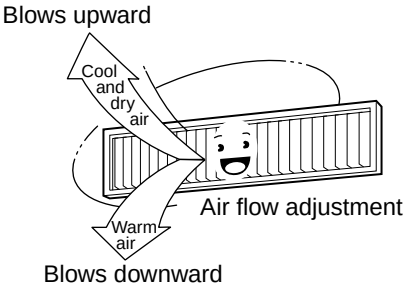
Adjust the air flow direction for the even circulation of room air.



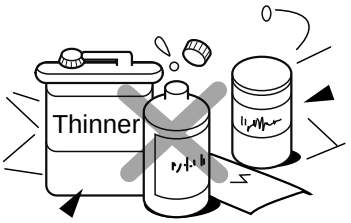


# MAINTENANCE

### Cleaning of remote controller

**CAUTION**

- Use a dry cloth to wipe the remote controller.
- A cloth dampened with cold water may be used on the indoor unit if it is very dirty.
- Never use a damp cloth on the remote controller.
- Do not use a chemically-treated duster for wiping or leave such materials on the unit for long. It may damage or fade the surface of the unit.
- Do not use benzine, thinner, polishing powder, or similar solvents for cleaning. These may cause the plastic surface to crack or deform.




### If you do not plan to use the unit for more than 1 month

(1) Operate the fan for 3 to 4 hours to dry inside the unit
Operate “FAN ONLY” mode with set temperature 30°C.

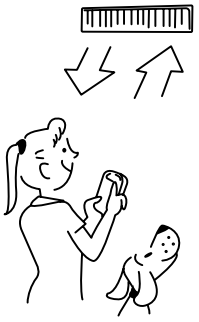
(2) Stop the air conditioner and turn off the main power switch or the circuit breaker.

### Checks before operation

(1) Check that the air filters are installed.

(2) Check that the air outlet or inlet is not blocked.

(3) Turn on the main power switch or the circuit breaker for the main power supply to the air conditioner.



**FAN ONLY operation**

**WARNING**

Cleaning of the air filter and other parts of the air filter involves dangerous work in high places, so be sure to have a service person do it. Do not attempt it yourself.

**NOTE**

For Air conditioning system which is operated regularly, cleaning and maintenance of the indoor/outdoor units are strongly recommended.
As a general rule, if an indoor unit is operated for about 8 hours daily, the indoor/outdoor units will need to be cleaned at least once every 3-MONTH. This cleaning and maintenance shall be carried out by a qualified person.
Failure to clean the indoor/outdoor units regularly will result in poor performance, icing, water leaking and even compressor failure.

# AIR CONDITIONER OPERATIONS AND PERFORMANCE

## 3 minutes protection function

3-minutes protection function prevents the air conditioner from starting for initial 3 minutes after the main power switch/circuit breaker is turned on for re-starting the air conditioner.

## Power failure

Power failure during operation will stop the unit completely.

- To restart the operation, push the START/STOP button on the remote controller.
- Lightning or a wireless car telephone operating nearby may cause the unit to malfunction. Turn off the main power switch or circuit breaker and then turn them on again. Push the START/STOP button on the remote controller to restart.

## Heating characteristics
## Preheating operation

The air conditioner will not deliver warm air immediately after it is turned on. Warm air will start to flow out after approximately 5 minutes when the indoor heat exchanger warmed up.

## Warm air control (In heating operation)

When the room temperature reaches the set temperature, the fan speed is automatically reduced to prevent to blow cold draft. At this time, the outdoor unit will stop.

## Defrosting operation

If the outdoor unit is frosted during the heating operation, defrosting starts automatically (for approximately 2 to 10 minutes) to maintain the heating capacity.

- The fans in both indoor and outdoor units will stop during the defrosting operation.
- During the defrosting operation, the defrosted water will be drained from the bottom plate of the outdoor unit.

## Heating capacity

In the heating operation, the heat is absorbed from the outside and brought into the room. This way of heating is called heat pump system. When the outside temperature is too low, it is recommended to use another heating apparatus in combination with the air conditioner.

## Attention to snowfall and freeze on the outdoor unit

- In snowy areas, the air inlet and air outlet of the outdoor unit are often covered with snow or frozen up. If snow or freeze on the outdoor unit is left as it is, it may cause machine failure or poor warming.
- In cold areas, pay attention to the drain hose so that it perfectly drains water without water remaining inside for freeze prevention. If water freezes in the drain hose or inside the outdoor unit, it may cause machine failure or poor warming.

## Air conditioner operating conditions

For proper performance, operate the air conditioner under the following temperature conditions:

| | | |
|---|---|---|
| Cooling operation | Outdoor temperature | : –5°C to 43°C |
| | Room temperature | : 21°C to 32°C (Dry valve temp.), 15°C to 24°C (Wet valve temp.) |
| | **CAUTION** | Room relative humidity – less than 80 %. If the air conditioner operates in excess of this figure, the surface of the air conditioner may cause dewing. |
| Dry operation | Outdoor temperature | : 15°C to 43°C (Maximum suction air temp. 46°C) |
| | Room temperature | : 17°C to 32°C |
| Heating operation | Outdoor temperature | : –15°C to 15°C (Wet valve temp.) |
| | Room temperature | : 15°C to 28°C (Dry valve temp.) |

If air conditioner is used outside of the above conditions, safety protection may work.

## RE-INSTALLATION

**DANGER**

**Ask the dealer or an installation professional to re-install the air conditioner to a new place or move it to another place and to observe the following items.**

**If the air conditioner is inappropriate installed by yourself, it may cause electric shock or fire.**

### Do not install the air conditioner in the following places

- Do not install the air conditioner in any place within 1 m from a TV, stereo, or radio set. If the unit is installed in such place, noise transmitted from the air conditioner affects the operation of these appliances.
- Do not install the air conditioner near a high frequency appliance (sewing machine or massager for business use, etc.), otherwise the air conditioner may malfunction.
- Do not install the air conditioner in a humid or oily place, or in a place where steam, soot, or corrosive gas is generated.
- Do not install the air conditioner in a salty place such as seaside area.
- Do not install the air conditioner in a place where a great deal of machine oil is used.
- Do not install the air conditioner in a place where it is usually exposed to strong wind such as in seaside area or on the roof or upper floor of a building.
- Do not install the air conditioner in a place where sulfureous gas generated such as in a spa.
- Do not install the air conditioner in a vessel or mobile crane.

### Be careful with noise or vibrations

- Do not install the air conditioner in a place where noise by outdoor unit or hot air from its air outlet annoys your neighbors.
- Install the air conditioner on a solid and stable foundation so that it prevents transmission of resonating, operation noise and vibration.
- If one indoor unit is operating, some sound may be audible from other indoor units that are not operating.

## TROUBLES AND CAUSES

**CAUTION**

If any of the following conditions occur, turn off the main power supply switch and immediately contact the dealer :

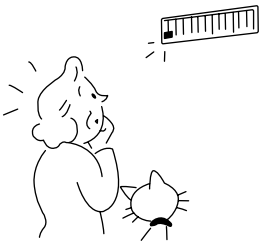
- The operation lamps flash at short intervals (5 Hz) even though you have tried turning off the power supply and turning on again after 2 or 3 minutes.
- Switch operation does not work properly.
- The main power fuse often blows out, or the circuit breaker is often activated.
- A foreign matter or water fall inside the air conditioner.
- Any other unusual conditions are observed.

**Before you ask for servicing or repairs, check the following points.**

**Recheck**

### Inoperative

- The main power switch is turned off.
- The circuit breaker is activated to cut off power supply.
- The main power fuse has blown out.
- Stoppage of electric current.



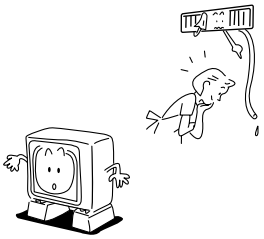
### Does not cool well or heat well

- The air inlet and/or outlet of the outdoor unit is blocked.
- Doors or windows are opened.
- The fan speed is set to low.
- The air conditioner is set in the DRY mode.
- The set temperature is too high. (In cooling operation)
- The set temperature is too low. (In heating operation)

**These are not failures.**

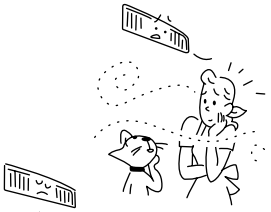
### Indoor unit or outdoor unit makes a strange noise.

- When the temperature suddenly changes, the indoor or outdoor unit occasionally makes a strange noise because of changing of refrigerant flow or expansion work.



### The room air is smelly or a bad odor comes from the air conditioner.

- Smells impregnated in the walls, carpets, furniture, clothing, or furs, come out from the air conditioner.



### Outdoor unit is frosted in heating operation. Water drains from outdoor unit.

- The outdoor unit is sometimes frosted in heating operation.

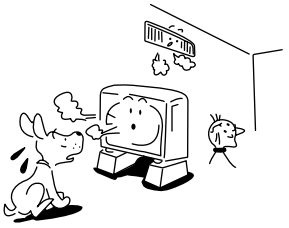
  In that case, the unit automatically performs defrosting (for 2 to 10 minutes) for increasing the heating efficiency.
- In defrosting operation, both the indoor and outdoor units stop air flow.
- Hiss sound is heard when flow of the refrigerant is changed for defrosting.
- Resultant water of automatic defrosting in heating operation drains from outdoor unit.

### Air flow changes without FAN button set to AUTO mode.

- When the temperature of blown air drops in heating operation, the air conditioner automatically changes or stops air flow from the indoor unit not to make persons in the room feel chilly.
- Air flow of the indoor unit is occasionally changed in the cooling operation.

### A white mist of chilled air or water is generated from the outdoor unit.

- The indoor unit in cooling operation or the outdoor unit in defrosting operation occasionally cause steams.



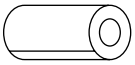
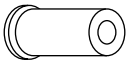
## TROUBLES AND CAUSES (Concerning Remote Controller)

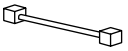
Before you ask for servicing or repairs, check the following points:

| Setting Change is Impossible | | |
|---|---|---|
| **Symptoms** | **Causes** | **Reason and Disposal** |
| The fan speed can not be changed. | • Check whether the MODE indicated on the display is “AUTO”.<br>**AUTO** Ⓐ | When the automatic mode is selected, the air conditioner automatically selects the fan speed. |
| | • Check whether the MODE indicated on the display is “DRY”.<br>**(DRY)** ♢ | When dry operation is selected, the air conditioner automatically selects the fan speed. |

# Accessory parts and Parts to be procured locally

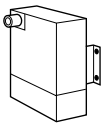
## ❒ Accessory parts

| Part name | Q'ty | Shape |
|---|---|---|
| Pipe insulator | 2 |  |
| Drain hose socket for drain pipe connection | 1 |  |

| Part name | Q'ty | Shape |
|---|---|---|
| Connecting cable for High static pressure tap | 1 |  |
| Installation Manual | 1 | |
| Owner's Manual | 1 | |

### <Separate sold parts>

| Part name | Q'ty | Shape |
|---|---|---|
| Standard wired remote controller | 1 | |

| Part name | Q'ty | Shape |
|---|---|---|
| Drain-up kit | 1 |  |

## ❒ Parts to be procured locally

| |
|---|
| Connecting pipe (Liquid side)<br>(6.35mm (diam.), Nominal (diam.) 1/4" thick 0.8mm)<br>RAV-SM800BT-E, RAV-SM560AT-E<br><br>(9.52mm (diam.), Nominal (diam.) 3/8" thick 0.8mm)<br>RAV-SM560BT-E, RAV-SM800AT-E |
| Connecting pipe (Gas side)<br>(12.7mm (diam.), Nominal (diam.) 1/2" thick 0.8mm)<br>RAV-SM560BT-E, RAV-SM560AT-E<br><br>(15.9mm (diam.), Nominal (diam.) 5/8" thick 1.0mm)<br>RAV-SM800BT-E, RAV-SM800AT-E |
| Power supply cord<br>2.5mm² (H07RN-F or 245IEC66) or 3.5mm² (AWG-12) |

| |
|---|
| Connecting cable<br>H07RN-F or 245IEC66 (1.5mm² or more) |
| Thermal insulation for refrigerant pipe<br>(10mm or more, thermal insulating foam polyethylene) |
| Thermal insulation for drain pipe<br>(10mm or more, foam polyethylene) |
| Drain pipe (Outer 26mm (diam.)) |
| Tapes |
| Grounding cable (2.0mm (diam.) or more) |

# 1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this “PRECAUTIONS FOR SAFETY” carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
  Follow the Owner’s Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner’s Manual.

**CAUTION** **New Refrigerant Air Conditioner Installation**

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

**CAUTION** **To Disconnect the Appliance from Main Power Supply.**

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

**The installation fuse (25A D type ) must be used for the power supply line of this conditioner.**

**WARNINGS**

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
  Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting cable correctly.**
  If the connecting cable is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
  If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may resultingly causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
  Do not store it in a wet basement or expose to rain or water.

- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
  If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
  If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
  An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Conform to the regulations of the local electric company when wiring the power supply.**
  Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
  If a combustible gas leaks, and stays around the unit, a fire may occur.

# 2 SELECTION OF INSTALLATION PLACE

**⚠ WARNING**

- **Install the air conditioner at enough strong place to withstand the weight of the unit.**
  If the strength is not enough, the unit may fall down resulting in injury.
- **Install the air conditioner at a height 2.5m or more from the floor.**
  If you insert your hands or others directly into the unit while the air conditioner operates, it is dangerous because you may contact with revolving fan or active electricity.

**⚠ CAUTION**

- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
  If a combustible gas leaks and stays around the unit, a fire may occur.

**Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.**

- Place where the unit can be installed horizontally.
- Place where a sufficient servicing space can be ensured for safety maintenance and check.
- Place where drained water will not cause any problem.

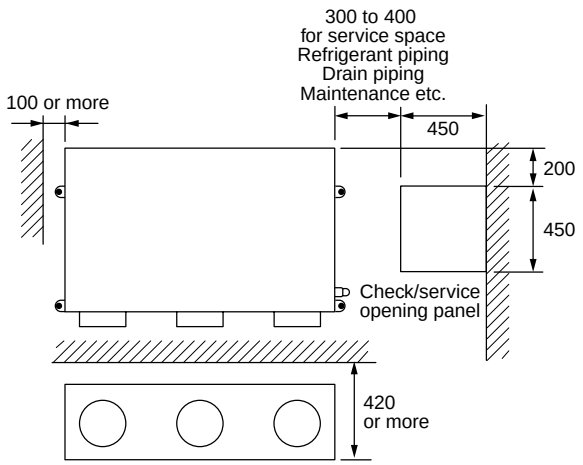
**Avoid installing in the following places.**

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- Place exposed to oil, vapor, oil smoke or corrosive gas.
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighboring house. (For outdoor unit)
- Place where noise of the outdoor unit is easily transmitted.
  (When installing the air conditioner on the boundary with the neighbor, pay due attention to the level of noise.)
- Place with poor ventilation. (Before air ducting work, check whether value of air volume, static pressure and duct resistance are correct.)



## Installation space

**Secure the space required to installation and servicing.**




## Selection of installation place

In case of continued operation of the indoor unit under high-humidity conditions as described below, dew may condense and water may drop.

Especially, high-humidity atmosphere (dew point temperature : 23°C or more) may generate dew inside the ceiling.

1. Unit is installed inside the ceiling with slated roof.
2. Unit is installed at a location using inside of the ceiling as fresh air take-in path.
3. Kitchen

If installing a unit at such place, adhere insulating material (glass wool, etc.) additionally over all the positions of the indoor unit which come to contact with high-humidity atmosphere.

## Advice

Set a check service opening panel at right side of the unit (size: 450 x 450mm) for piping, maintenance, and servicing.

# 3 INSTALLATION OF INDOOR UNIT

**⚠ WARNING**

Install the air conditioner certainly at a place to sufficiently withstand the weight.
If the strength is insufficient, the unit may fall down resulting in human injury.
Perform a specified installation work to guard against an earthquake.
An incomplete installation can cause accidents by the units falling and dropping.

## Installation procedure

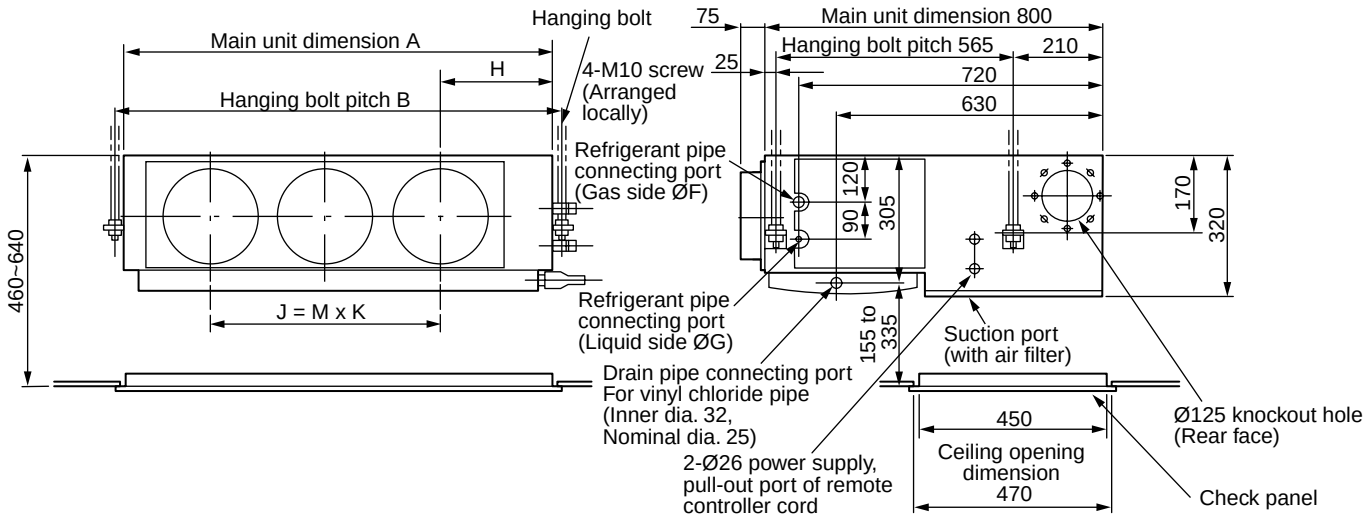
1. Lay drain pipes, refrigerant pipes, and connecting cables behind wall or ceiling concurrently with supply/drain water work and piping work.
2. Install the mounting frames of supply/return air panels
3. Position the refrigerant and drain pipes
4. Install the indoor unit
   - Preparation for installation
   - Setting/fixing of indoor unit
5. Connect cables and pipes
6. Install supply/return air panels
7. Mount thermal insulation
8. Mount check port

# 3 INSTALLATION OF INDOOR UNIT

## External view

**REQUIREMENT**

The hanging bolt pitch on horizontal direction (B) is not halved at center with the ceiling opening size.
Therefore, check the relational position in the following figure.




- **Dimension**

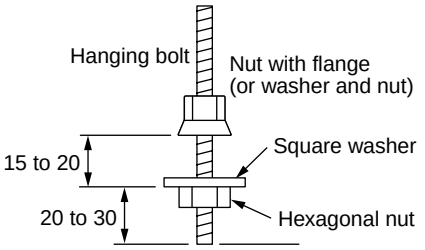
| | A | B | F | G | H | J | K | M | N |
|---|---|---|---|---|---|---|---|---|---|
| **RAV-SM560BT-E** | 700 | 750 | 12.7 | 6.4 | 252 | 280 | 280 | 1 | 2 |
| **RAV-SM800BT-E** | 1000 | 1050 | 15.9 | 9.5 | 252 | 580 | 290 | 2 | 3 |

### 1. Hanging down of indoor unit

Refer to installation figures of hanging material and hanging bolt.

- Adjustment of hanging bolt length and nut position

  Adjust hanging bolt length and nut position as shown in the figure before hanging down the indoor unit.



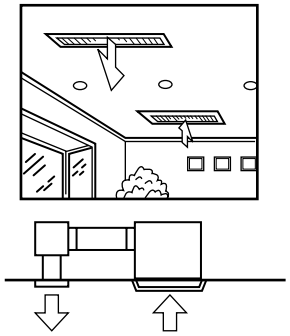

**NOTE :**

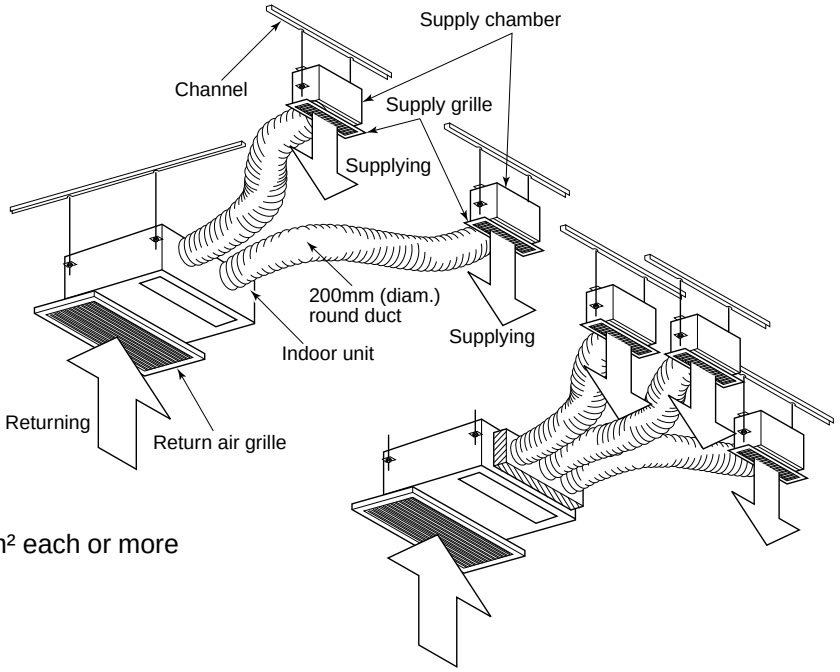
Be sure to set the indoor unit horizontally so as not to cause malfunction of the float switch or leakage of water.

Considering pipe/wire connecting work inside the ceiling after the indoor unit has been hanged, select an installation place and determine piping direction.

- If the ceiling has been already set, prepare refrigerant pipe, drain pipe, connecting wire, switch panel cord, etc. at the place where pipe and wire are connected before hanging the main unit.

## Concealed duct type

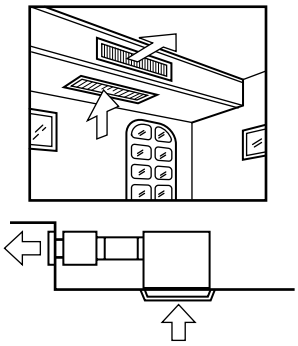


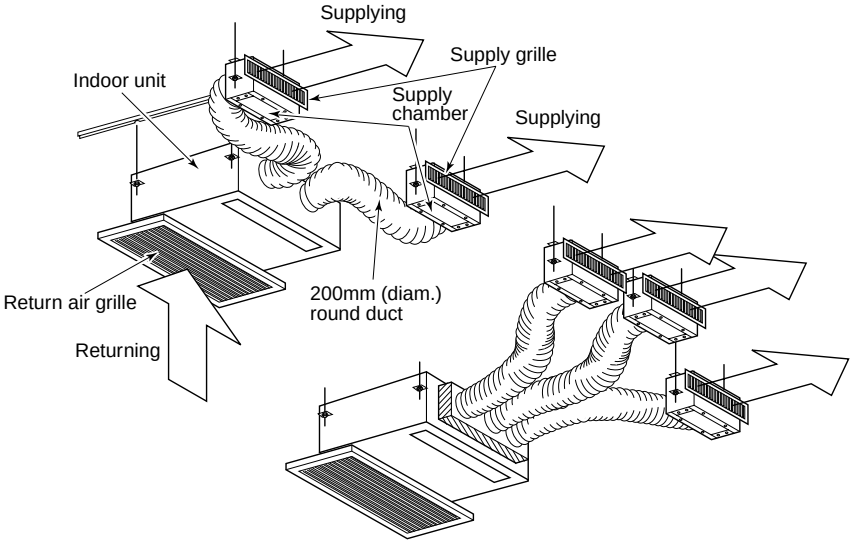



**NOTE:**

- Recommended supplying grille size 400 cm² each or more

## Ledge ceiling concealed duct type






### Quality of supplying grilles

| | |
|---|---|
| **SM560BT-E** | 2 |
| **SM800BT-E** | 3 |

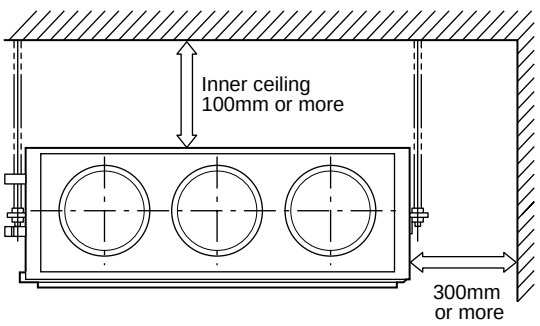
**NOTE:**

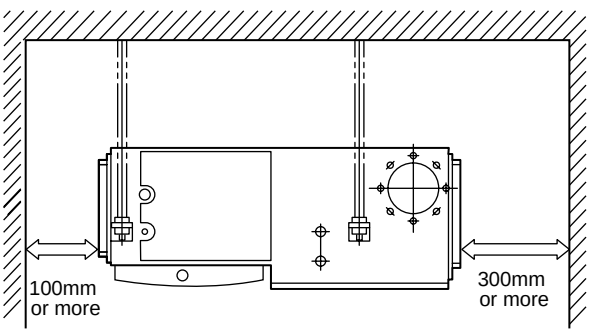
- Opening area of the return grille should be larger than the one for suction port (Air filter) of the indoor unit.

## Restriction to installation

### 1. Installation clearance

- As shown in the figure, keep clearance around the indoor unit.



# 4 AIR DUCTING WORK

## Static pressure characteristics of each model

**Fig. 1 RAV-SM560BT-E**

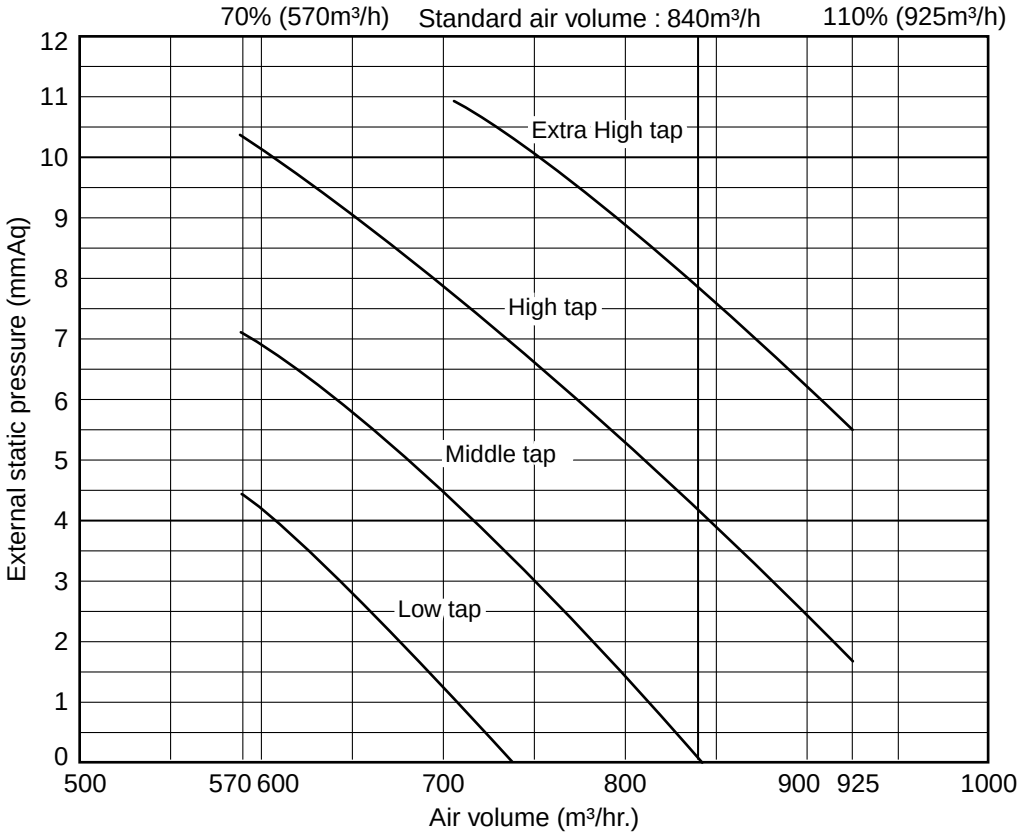
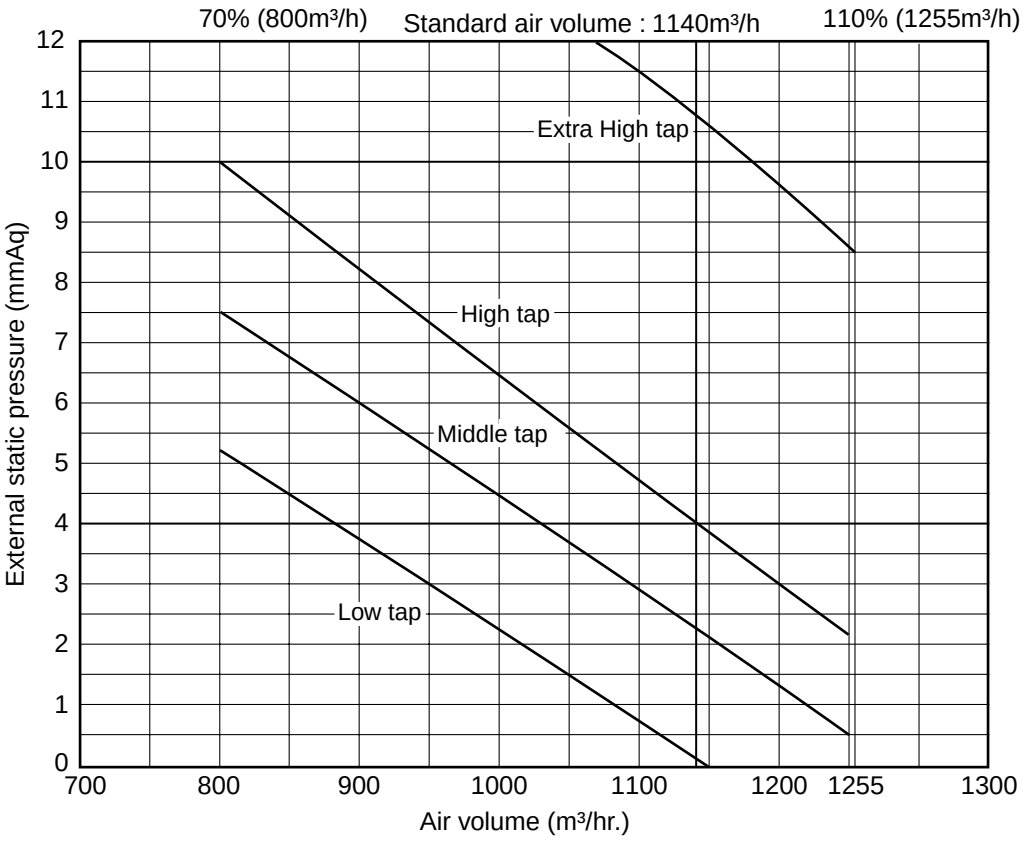


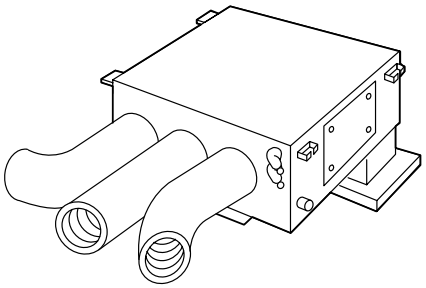

**Fig. 2 RAV-SM800BT-E**



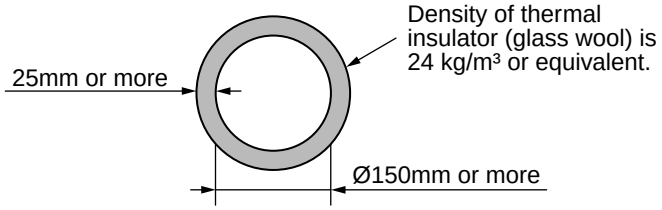
## Installation Reference (exp. for RAV-SM800BT-E model)

The air supply ducting work is classified in two ways, one is branched by the round ducts, and the other is branched by the square ducts. (Be sure to divide the air supply duct into three or more branches.)

**<Round duct>**

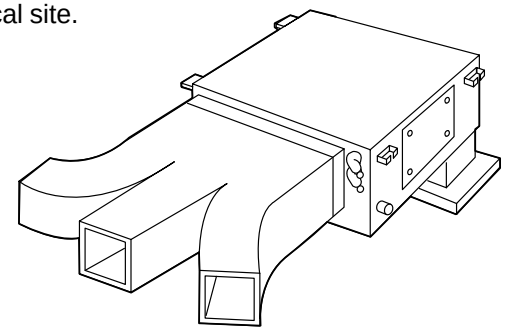


In case of the round duct, use the thermal insulator of thickness 25mm or more and inner diameter 150mm or more to the duct board.
(If the inner diameter is not enough, resistance increase, as the result, air does not flow smoothly and loss of the static pressure increases.) For the thermal insulator, use high-density glass wool of 24kg/m³ or equivalent.

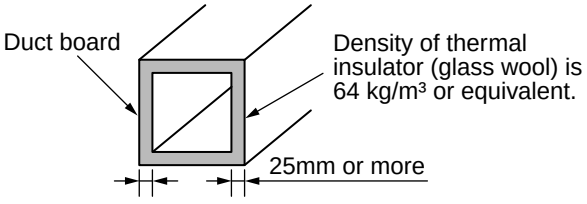



**<Square duct> (Reference for square duct)**

When using the square duct, change the type of the air supply flange from round type to square flange at the local site.



In case of the square duct, apply the thermal insulator of thickness 25mm or more to the duct board. For the thermal insulator, use high-density glass wool of weight 64kg/m³.




## Connecting method of the duct

### 1. Supply air side

**<Round duct>**

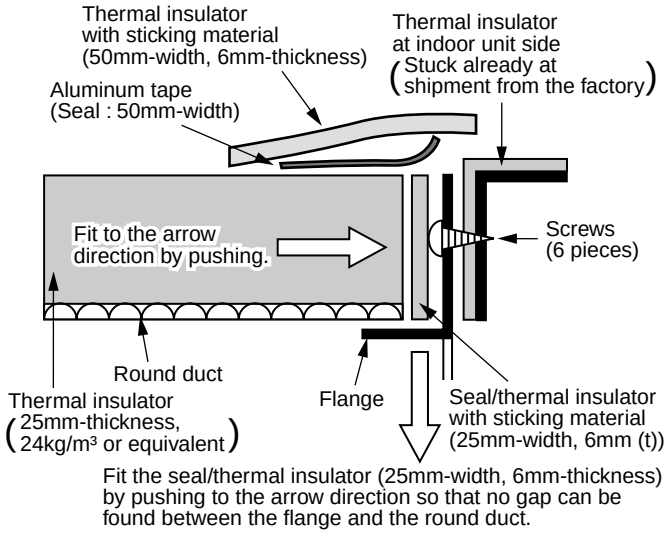

Thermal insulator with sticking material (50mm-width, 6mm-thickness)
Thermal insulator at indoor unit side (Stuck already at shipment from the factory)
Aluminum tape (Seal : 50mm-width)
Fit to the arrow direction by pushing.
Screws (6 pieces)
Round duct
Thermal insulator (25mm-thickness, 24kg/m³ or equivalent)
Flange
Seal/thermal insulator with sticking material (25mm-width, 6mm (t))
Fit the seal/thermal insulator (25mm-width, 6mm-thickness) by pushing to the arrow direction so that no gap can be found between the flange and the round duct.

**Fig. 2 (a)**

**<Square duct>**

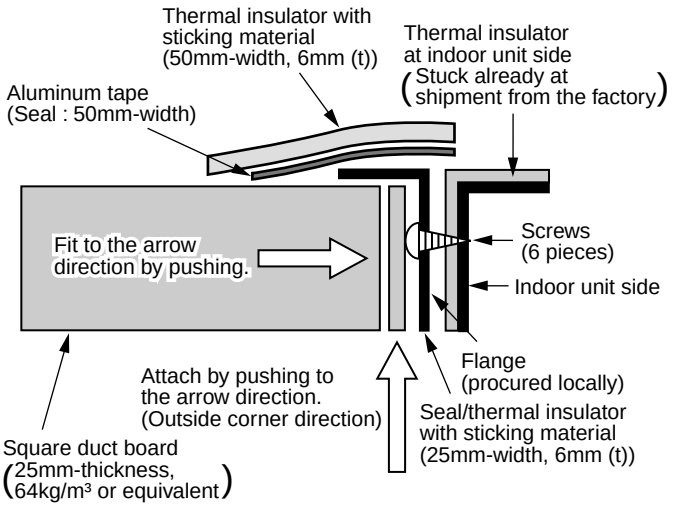

Thermal insulator with sticking material (50mm-width, 6mm (t))
Thermal insulator at indoor unit side (Stuck already at shipment from the factory)
Aluminum tape (Seal : 50mm-width)
Fit to the arrow direction by pushing.
Screws (6 pieces)
Indoor unit side
Flange (procured locally)
Attach by pushing to the arrow direction. (Outside corner direction)
Seal/thermal insulator with sticking material (25mm-width, 6mm (t))
Square duct board (25mm-thickness, 64kg/m³ or equivalent)

**Fig. 2 (b)**

**CAUTION**

Incomplete thermal insulation of the supply air flange and sealing may cause dew drops.

# 4 AIR DUCTING WORK

## Connecting method of the duct

### 1. Supply air side

**<Round duct>**

1. Make the round duct according to inner dimension of the flange

   Use a glass wool board with inside/outside finishing 25mm-thickness and 24kg/m³-density.
2. Connect the flange and each type of duct. (Fig. 1)

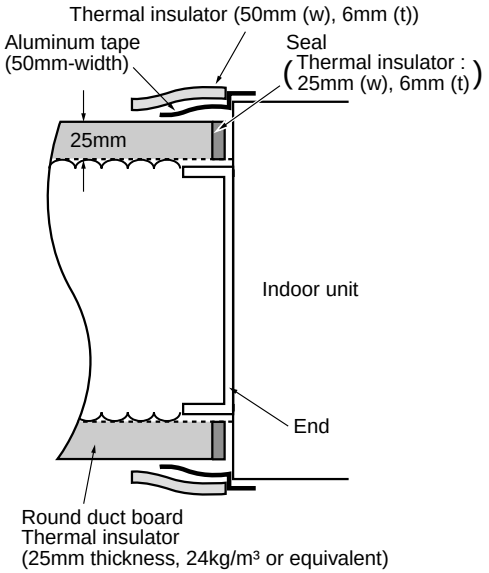



**Fig. 1**

**<Square duct>**

1. Using 6 screws, mount the flange to the supply air port of the indoor unit. (Fig. 2)
2. Make the square duct according to inner dimension of the flange A x B.

   Use a glass wool board with inside/outside finishing 25mm-thickness and 24kg/m³-density.
3. Connect the flange and each type of duct. (Fig. 3)

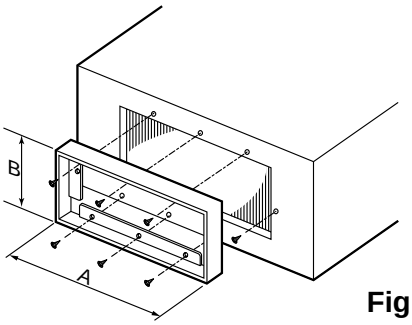



**Fig. 2**

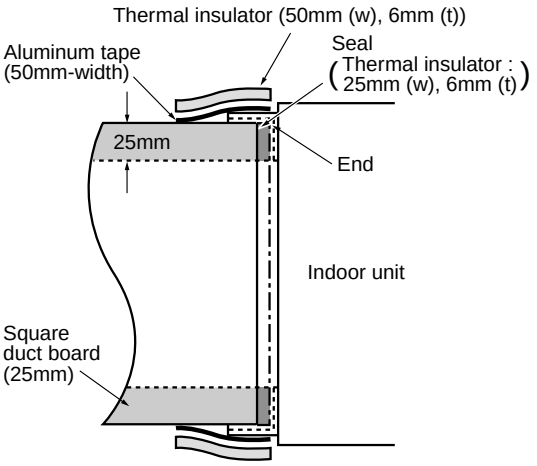



**Fig. 3**

## Points at installation work

### ■ General cautions

1. Considering installation places of indoor unit supply chamber, structure of the building and determine the duct path.
2. In order to utilize the static pressure characteristics of the air supply in the indoor unit, design the duct branching having the large size of the air supply chamber or setting distance to the first branch as long as possible (Min. : 200mm or longer) so that an even air volume can be obtained.

   Especially, when branching just after air supply of the indoor unit, air concentrates at the center part and is difficult to flow to the ducts at both sides.
3. Connect each connecting section surely, and apply sufficient thermal insulation.

   In this model of which the duct is branched in the ceiling, compared with the model for ordinary houses, the high temperature generates on the periphery in the cooling time (Especially, at attic and etc.), temperature difference increases between the supply air and outside of the duct, and dewing may occur.

   Dewing on the surface of the thermal insulator covering the metal connecting section or leaking portion of the cooled air may cause a trouble such as water drops.
4. Thermal insulation of screwing sections is necessary.

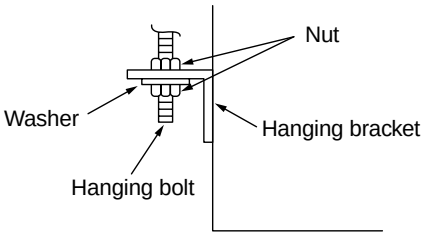
   Prevent dewing by applying thermal insulation to 6 screws those fix the duct flange of the air supply chamber.
   - For duct parts, the flexible branch duct (thermal insulation, 25mm or more thickness) is recommended.
   - Adjust the duct length to 6m or less even for straight pipe, and avoid sharp bending (Air flow resistance is large.) if bending.

## Hanging of indoor unit

Lift up the unit with a lifter, etc., and set the hanging metal in the hanging bolt.

- Hook nut of the hanging bolt to the groove of the hanging metal on the main unit.
- Using the level, etc., install the main unit horizontally.

  Failure to do this will cause water leakage




## Mounting of filter and canvas for suction port

1. Mount a long-life filter or a high-performance filter according to each Installation Manual.
2. Mount the canvases for suction port to the lower side of the above filter.

## Mounting of remote controller

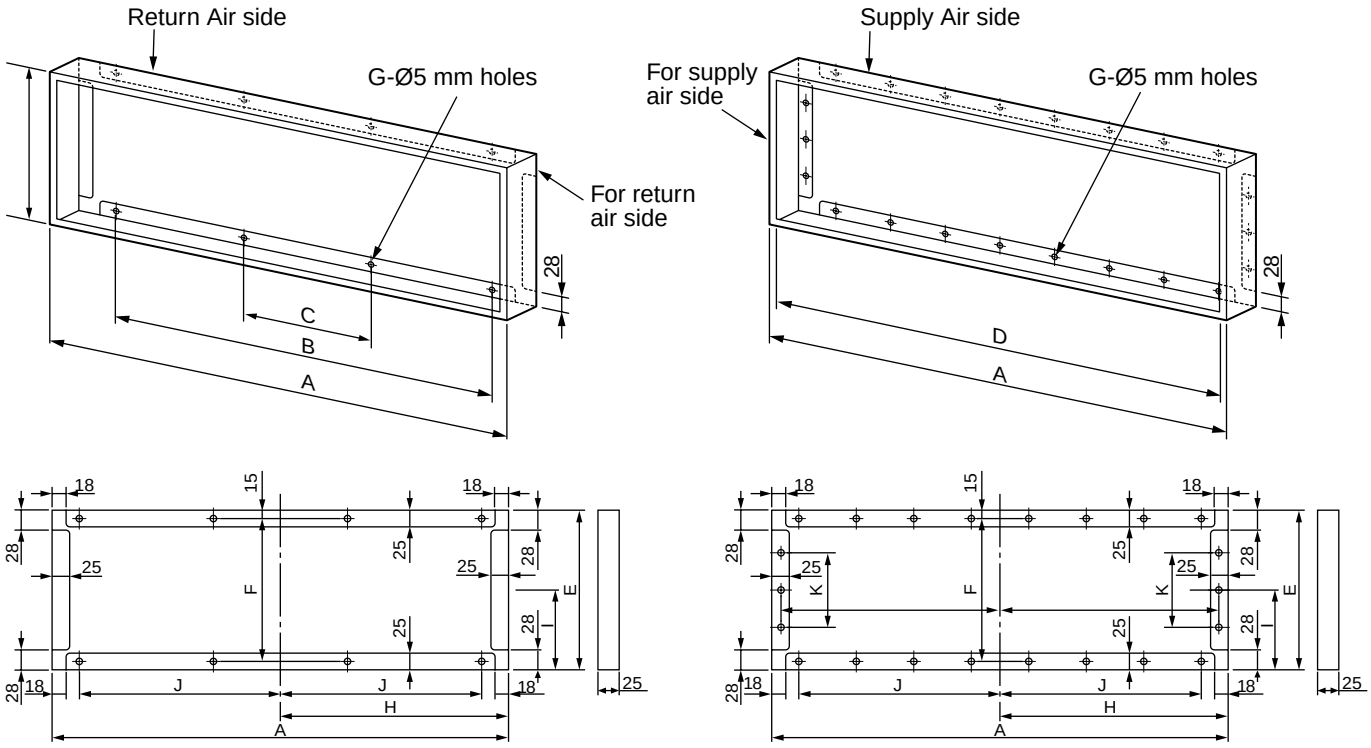
For the mounting of the wired remote controller, refer to the Installation Manual attached to the remote controller.

- Take out the remote controller cord together with the refrigerant pipe or drain pipe. Be sure to set the remote controller cord so that it passes through the upper side of the refrigerant pipe and drain pipe.

## For reference

**<Square duct>**

(Procured locally)

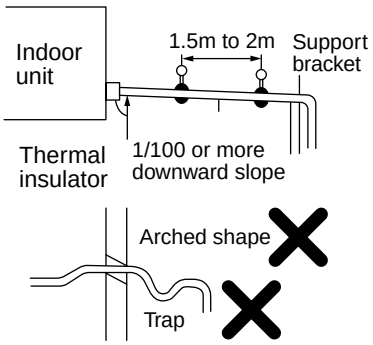



| | Model | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Return Air side (Return filter side) | RAV-SM560BT-E | 700 | — | 400 | — | 439 | 409 | 4 | 350 | 226 | — | — |
| | RAV-SM800BT-E | 1000 | 700 | 430 | — | 439 | 409 | 8 | 500 | 226 | 350 | — |
| Supply Air side | RAV-SM560BT-E | 550 | 455 (65 x 7) | 65 | 530 | 265 | 245 | 22 | 275 | 132.5 | 227.5 | 130 |
| | RAV-SM800BT-E | 850 | 715 (65 x 11) | 65 | 830 | 265 | 245 | 30 | 425 | 132.5 | 307.5 | 130 |

# 5 DRAIN PIPING WORK

## Piping material

- For laying pipes underground, use hard vinyl chloride pipe. (Inner diam. 20 or 25mm)



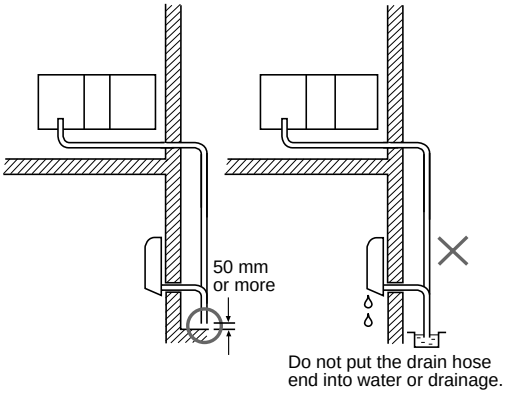

## Piping and cautions

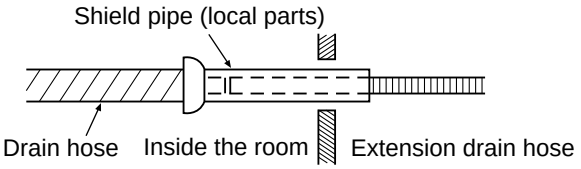
- Set drain side of pipe at downward slope. (1/100 or more)
- Be sure to apply thermal insulation (foaming polyethylene, 10mm-thickness or more) for pipes passing through the room.
- Adhere the connecting sections with vinyl chloride agent surely so that no water leakage is caused.
- Support the piping with hanging bracket so that the force is not applied to connection sections of pipe and pipe is not waved.

**NOTES :**

- Do not make slack or trap at halfway across piping.
- Set pipes so that the end of drain pipe is not dipped in water, and also keep space 50mm or more to the ground.
- After piping work, check if water drains smoothly.
- Hole should be made at a slight downward slant to the outdoor side.
- When connecting extension drain hose, insulate the connecting part of extension drain hose with shield pipe.

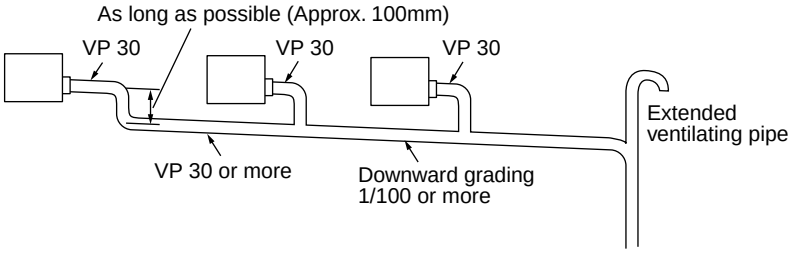
- As shown in the figure, set the collective piping such as the ceiling duct so that waste water does not back up from the main pipe.




## Connection of the drain hose

- Insert the drain hose completely into the connecting port of the drain pan.
- Apply thermal insulation surely to the drain hose with socket thermal insulation seal.



# 6 REFRIGERANT PIPING

## Refrigerant Piping

1. If the outdoor units are to be mounted on a wall, make sure that the supporting platform is sufficiently strong. The platform should be designed and manufactured to maintain its strength over a long period of time, and sufficient consideration should be given to ensuring that the outdoor unit will not fall.
2. **Use copper pipe with 0.8 mm or more thickness.**
3. Flare nut and flare works are also different from those of the conventional refrigerant. Take out the flare nut attached to the main unit of the air conditioner, and use it.

**CAUTION**

**IMPORTANT 4 POINTS FOR PIPING WORK**

1. Remove dust and moisture from the inside of the connecting pipes.
2. Tight connection (between pipes and unit)
3. Evacuate the air in the connecting pipes using VACUUM PUMP.
4. Check the gas leakage. (connected points)

## Permissible Piping Length and Heat

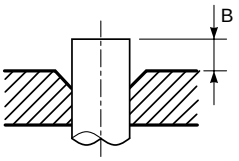
| **The maximum piping length from the outdoor to indoor unit** | |
|---|---|
| 30 m (Chargeless 20m) (RAV-SM560AT-E) | 50 m (Chargeless 20m) (RAV-SM800AT-E) |
| **The maximum height difference outdoor/indoor unit** | |
| **Outdoor unit is above** | **Outdoor unit is below** |
| 30m | 15m |

## Flaring

Insert a flare nut into the pipe, and flare the pipe.

As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.

However, the conventional tools can be used by adjusting projection margin of the copper pipe.




- **Projection margin in flaring : B (Unit : mm)**

Rigid (Clutch type)

| **Outer diam. of copper pipe** | **R410A tool used** | | **Conventional tool used** | |
|---|---|---|---|---|
| | **R410A** | R22 | **R410A** | R22 |
| 6.35 to 9.52 | 0 to 0.5 | (Same as left) | 1.0 to 1.5 | 0.5 to 1.0 |

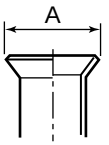
Imperial (Wing nut type)

| **Outer diam. of copper pipe** | **R410A** | R22 |
|---|---|---|
| 6.35 or 9.52 | 1.5 to 2.0 | 1.0 to 1.5 |
| 12.7 or 15.9 | 2.0 to 2.5 | 1.5 to 2.0 |

- **Flaring dia meter size : A (Unit : mm)**

| **Outer diam. of copper pipe** | **A $^{+0}_{-0.4}$** | |
|---|---|---|
| | **R410A** | R22 |
| 6.35 | 9.1 | 9.0 |
| 9.52 | 13.2 | 13.0 |
| 12.7 | 16.6 | 16.2 |
| 15.9 | 19.7 | 19.4 |

* In the case of flaring for R410A with the conventional flare tool, pull out it approx. 0.5 mm more than that for R22 to adjust to the specified flare size. The copper pipe gauge is useful for adjusting projection margin size.




## Tightening connection

**CAUTION**

- Do not apply excessive torque. Otherwise, the nut may crack depending on the conditions.

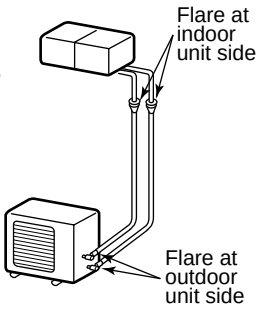
(Unit : N•m)

| **Outer diam. of copper pipe** | **Tightening torque** |
|---|---|
| 6.35 mm (diam.) | 14 to 18 (1.4 to 1.8 kgf•m) |
| 9.52 mm (diam.) | 33 to 42 (3.3 to 4.2 kgf•m) |
| 12.7 mm (diam.) | 50 to 62 (5.0 to 6.2 kgf•m) |
| 15.9 mm (diam.) | 63 to 77 (6.3 to 7.7 kgf•m) |

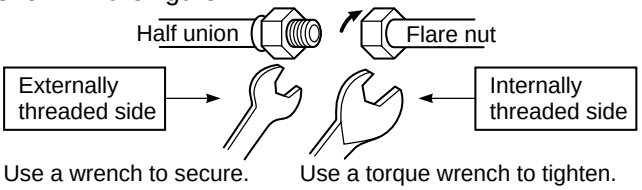
- **Tightening torque of flare pipe connections**

Pressure of R410A becomes higher than that of R22. (Approx. 1.6 times) Therefore, using a torque wrench, tighten firmly the flare pipe connecting sections which connect the indoor and outdoor units up to the specified tightening torque.

Incorrect connections may cause not only a gas leakage, but also a trouble of the refrigeration cycle or compressor damage.




Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. Then tighten the nut with a spanner and torque wrench as shown in the figure.



# 7 EVACUATING

**AIR PURGE**

Evacuate the air in the connecting pipes and in the indoor unit using vacuum pump.
Do not use the refrigerant in the outdoor unit.
For details, see the manual of vacuum pump.

## Use a vacuum pump

Be sure to use a vacuum pump with counter-flow prevention function so that inside oil of the pump does not flow backward into pipes of the air conditioner when the pump stops.

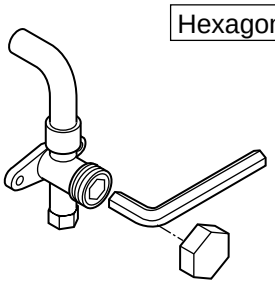
1. Connect the charge hose from the manifold valve to the service port of the gas side packed valve.
2. Connect the charge hose to the port of vacuum pump.
3. Open fully the low pressure side handle of the gauge manifold valve.
4. Operate the vacuum pump to start evacuating.
   Perform evacuating for about 35 minutes if the piping length is 30 meters total for model SM560 and 50 meters for model SM800
   (assuming a pump capacity of 27 liters per minute.)
   Then confirm that the compound pressure gauge reading is –101 kPa ( –76 cmHg).
5. Close the low pressure side valve handle of gauge manifold.
6. Open fully the valve stem of the packed valves (both sides of Gas and Liquid).
7. Remove the charging hose from the service port.
8. Securely tighten the caps on the packed valves.

## Packed valve handling precautions

- Open the valve stem all the way out ; do not try to open it beyond the stopper.
- Securely tighten the valve stem cap at the torque as follows:

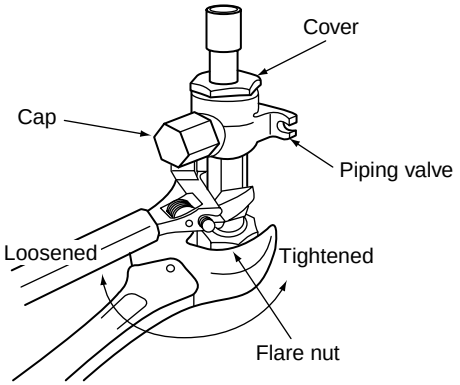
| | |
|---|---|
| 15.9 mm (diam.) | 63 to 77 N•m (6.3 to 7.7 kgf•m) |
| 12.7 mm (diam.) | 50 to 62 N•m (5.0 to 6.2 kgf•m) |
| 9.52 mm (diam.) | 33 to 42 N•m (3.3 to 4.2 kgf•m) |
| 6.35 mm (diam.) | 14 to 18 N•m (1.4 to 1.8 kgf•m) |

Hexagonal wrench is required.

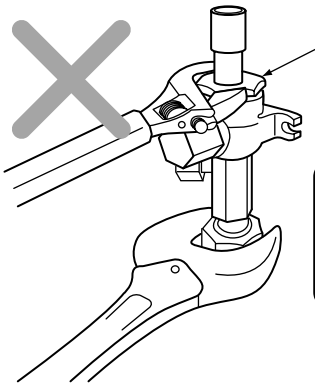


**<For RAV-SM800AT-E model>**

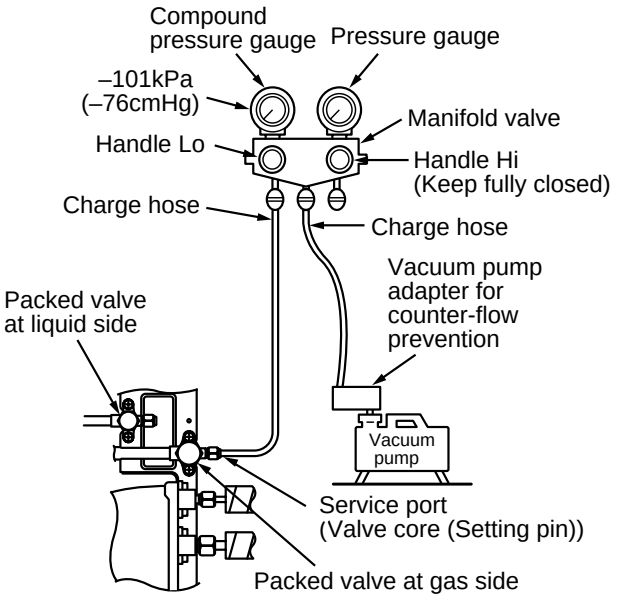
- As shown in the figure, be sure to use a double spanner to loosen or tighten the flare nut of the valve at gas side. If using a single spanner, the nut cannot be tightened with necessary tightening torque.
  On the contrary, use a single spanner to loosen or tighten the flare nut of the valve at liquid side.




**SM800 type valve at gas side**




Do not put the spanner or torque wrench, etc. on the cover.
The valve may be broken.



# 8 ELECTRICAL WORK

For the air conditioner that has no power cord.

**NOTE:**

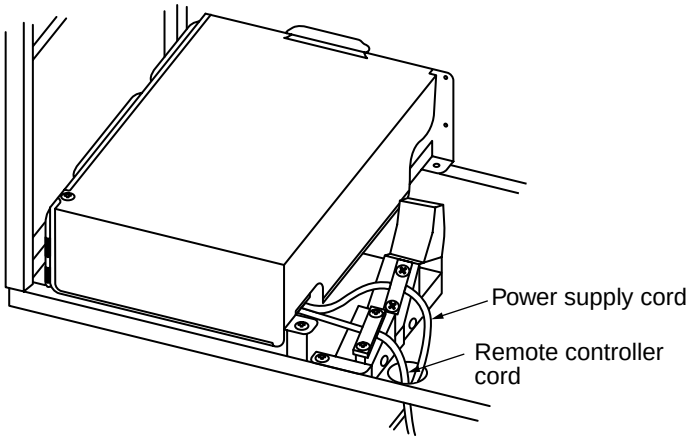
For selection and connection method of the power supply cords, refer to the details in the Installation Manual of the outdoor unit.

## CAUTIONS

- If incorrect/incomplete wiring is carried out, it may cause an electrical fire or smoke.
- Prepare the power supply for exclusive use with the air conditioner.
- Be sure to use the cord clamps with attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting cables when peeling them.
- Be sure to comply with local regulations on running the wire from outdoor unit to indoor unit (wire size of wire and wiring method etc.)
- Use the power cord and Inter-connecting cable of specified thickness, specified type, and protective devices required.

## How to wire

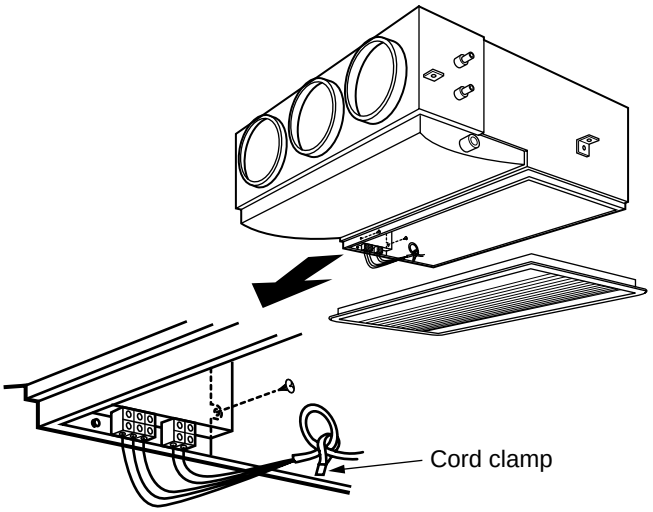
1. Connect the connecting cable to the terminal as identified with their respective numbers on the terminal block of indoor and outdoor unit.
   H07 RN-F or 245 IEC 66 (1.5 $mm^2$ or more)
2. Insulate the unsheathed redundant cords (conductors) with tape.
3. For inter-unit wiring, do not use a wire jointed to another on the way.



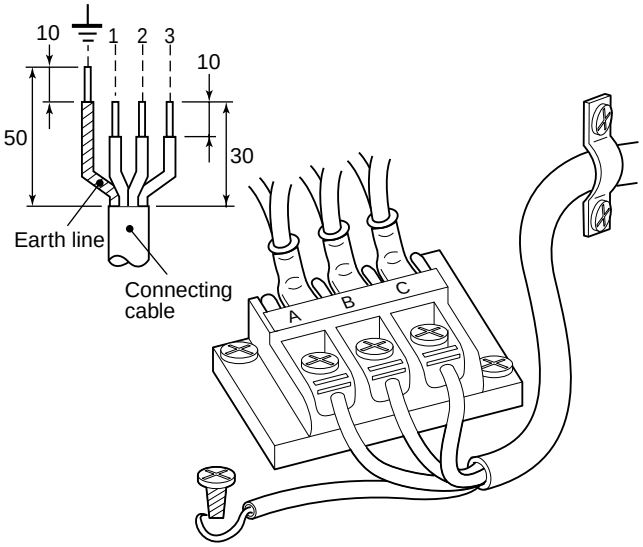

4. Fix the cable with cord clamp.

## Cabling

1. As shown in the figure, remove a screw ① and then remove cover of the electric part.
2. Strip wire ends (10 mm).
3. Match wire colors with terminal numbers on indoor and outdoor units' terminal blocks and firmly screw wires to the corresponding terminals.
4. Connect the ground wires to the corresponding terminals.
5. Fix the cable with cord clamp.
6. Fix cover of the parts box and the terminal block surely with the fixing screws.



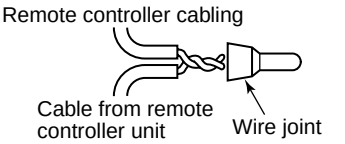

Make a loop for the margin of the cable length so that the electric parts box can be taken out during servicing.

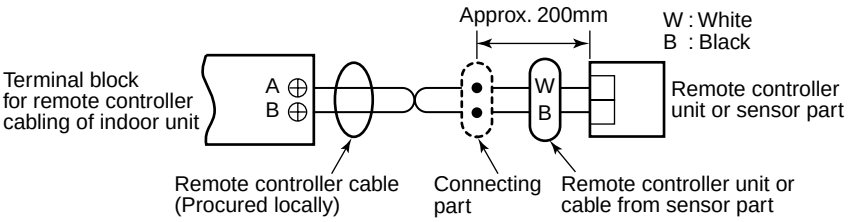


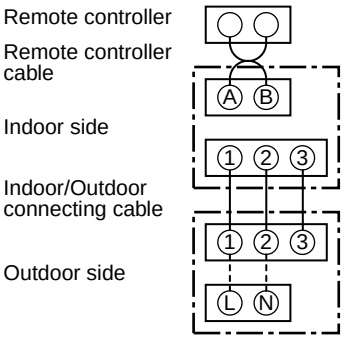
# 8 ELECTRICAL WORK

## Remote Controller Cabling

- Strip approx. 14mm the cable to be connected.
- Non polarity, 2 core cable is used for cabling of the remote controller.
- Twist cable of the remote controller to be connected with cable of the remote controller unit (or sensor), and press-fit them with a wire joint.
  (Wire joints (White: 2 pieces) are included in the attachments to the remote controller (sold separately) or the wireless remote controller kit (sold separately).




(Single phase 220/230/240V)

## Cabling diagram

- For details of cabling/installation of the remote controller, refer to the Installation Manual attached to the remote controller.
- When the remote controller is used for the first time, it accepts an operation approx. 5 minutes after the power supply has been turned on.
  It is not a trouble, but is because the setup of the remote controller is being checked.
  For the second power-ON time and after, approx. 1 minute is required to start the operation by the remote controller.

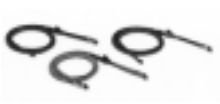
## Check and Test Operation

Be sure to test the pipe connections for gas leak.

- Check the flare nut connections, valve stem cap connections and service port cap connections for gas leak with a leak detector or some soap water.

# 9 INSTALLATION/SERVICING TOOLS

## Tools

| Tools | Applicable to R22 model | |
|---|---|---|
| Gauge manifold | □ | |
| Charge hose | □ |  |
| Electronic balance for refrigerant charging | ○ | |
| Torque wrench (nominal diam. 1/4, 3/8, 1/2, 5/8) | □ | |

| Tools | Applicable to R22 model | |
|---|---|---|
| Flare tool (clutch type) | ○ | |
| Gauge for projection adjustment | — | —— |
| Vacuum pump adapter | ○ | |
| Gas leak detector | □ | |

○ : Newly prepared (They are special requirements for R407C, separate from those for R22.)
□ : Existing tools are available.
For the details of the tools, refer to the Installation manual of the outdoor unit.

# 10 MAINTENANCE

## leaning of Return grille

### Preparation :

1. Turn off the air conditioner by the remote controller.
2. Dismount the Return grille.

## Clean the Return grilles with water:

- Wipe down the Return grille with a sponge or towel moistened with a kitchen detergent. (Do not use any metallic brush for cleaning.)
- **Carefully rinse the Return grille to wash out the detergent.**
- **After rinsing the Return grille with water, dry it in the shade.**

**CAUTION**

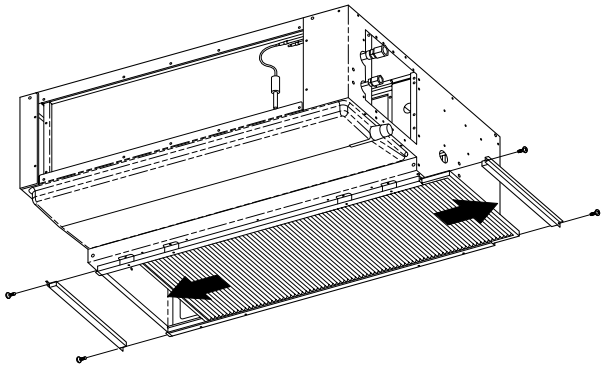
- Do not start the air conditioner while leaving the return grille removed.

## Cleaning of Air Filters

- If the air filters are not cleared, it not only impairs the cooling performance of air conditioner but causes a failure in the air conditioner such as water drops.

### Preparation :

1. Turn off the air conditioner by the remote controller.
2. Dismount the Return grille.

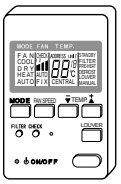


## Use a vacuum cleaner to remove dust from the filters or wash them with water.

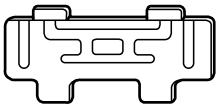
- After rinsing the air filters with water, dry them in the shade.
- Set the air filter into the air conditioner.

# ACCESSORIES

| Remote controller | Installation plate | Screws for installation plate Ø4mm x 25mm |
|---|---|---|



(sold separately)



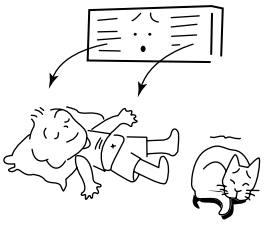
# PRECAUTIONS FOR SAFETY

## WARNING ⚠

### WARNINGS ABOUT INSTALLATION

- Make sure to ask the qualified installation professional in electric work to install the air conditioner.
  If the air conditioner is inappropriate installed by yourself, it may cause water leak, electric shock, fire, and so on.
- Ground the air conditioner without fail.
  Do not connect the ground wire to gas pipe, water pipe, lightning rod or ground wire of telephone. If the air conditioner is imperfectly grounded, it may cause electric shock.

## CAUTION

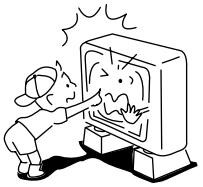


TO DISCONNECT THE APPLIANCE FROM THE MAINS SUPPLY

This appliance must be connected to the mains by means of a switch with a contact separation of at least 3 mm.

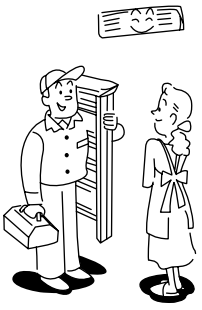
**The installation fuse (25A D type ) must be used for the power supply line of this conditioner.**

### WARNINGS ABOUT OPERATION



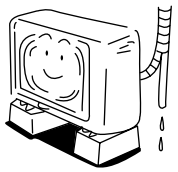
- Avoid cooling the room too strong or exposing the human body to cool breeze for a long time as it is bad for the health.
- When you notice something abnormal with the air conditioner (smells like something scorching, poor cooling, etc.), immediately turn off the main switch, the circuit breaker, from the mains to stop the air conditioner, and contact the dealer.
  If the air conditioner is continuously operated with something abnormal, it may cause machine failure, electric shock, fire, and so on.

### WARNINGS ABOUT MOVEMENT AND REPAIR

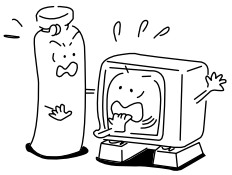


- Do not move or repair any unit by yourself.
  Since there is high voltage inside the unit, you may get electric shock when removing the cover and main unit.
- Whenever the air conditioner needs repair, make sure to ask the dealer to do it. If it is repaired imperfectly, it may cause electric shock or fire.
- When moving the air conditioner for re-installing at another place, ask the dealer to do it. If it is imperfectly installed, it may cause electric shock or fire.

## CAUTION

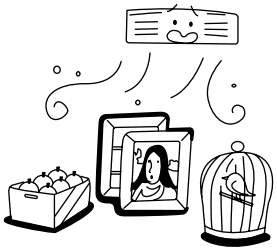


### CAUTIONS ABOUT INSTALLATION

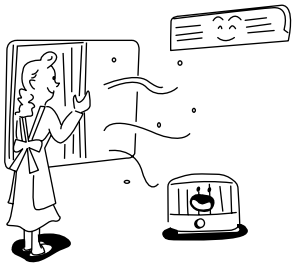


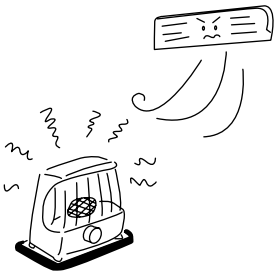
- Certainly lay the drain hose for perfect draining.
  Bad drainage may cause flooding in the house and getting furniture wet.
- Make sure to connect the air conditioner to an exclusive power supply of the rated voltage, otherwise the unit may break down or cause a fire.
- Do not install the unit in a place where inflammable gas may leak.
  If inflammable gas accumulates around the unit, it may cause a fire.

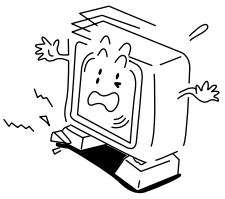
### CAUTIONS ABOUT OPERATION

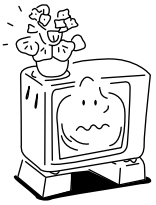


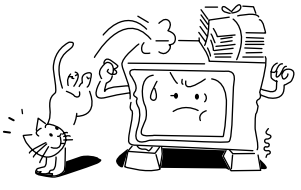
- Carefully read this manual before starting the air conditioner.
  There are many important things to keep in mind for daily operation.
- Do not use this air conditioner for special purpose such as preserving food, precision instruments, art objects, breeding animals, growing potted plants, etc.
- Avoid exposing potted plants and animals to the wind of the air conditioner, since it badly affects the health and growth of them.
- When the air conditioner is operated with a combustion appliance in the same place, be careful of ventilation to let fresh air enter the room.
  Poor ventilation causes oxygen shortage.
- Do not place any combustion appliance in a place where it is directly exposed to the wind of air conditioner, otherwise it may cause imperfect combustion.
- When the air conditioner is used in a closed room, be careful of sufficient ventilation of the room. Poor ventilation causes oxygen shortage.
- Do not touch any switches with wet finger, otherwise you may get an electric shock.
- If the air conditioner won't be used for a considerably long time, turn off the main switch or the circuit breaker, for safety.
- Check the concrete blocks, etc. of the base of the outdoor unit occasionally.
  If the base is left damaged or deteriorated, the unit may topple over and inflict an injury to a person as the worst case.
- Do not put anything on the outdoor unit nor step onto it. If you do so, it may not only topple over the unit but also injure yourself.
- To make the air conditioner operate in its original performance, operate it within the range of the operating temperature specified in the instructions.
  Otherwise it may cause a malfunction, or water leak from the unit.
- Prevent any liquid from falling into the remote controller. Do not spill juice, water or any kind of liquid.









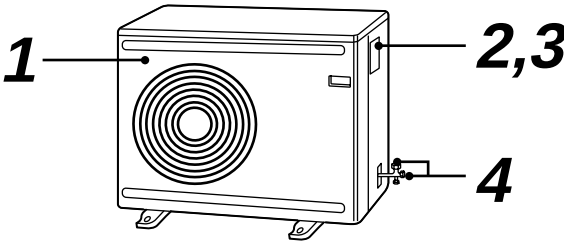


RAV-SM560KRT-E
RAV-SM800KRT-E

## PARTS NAME

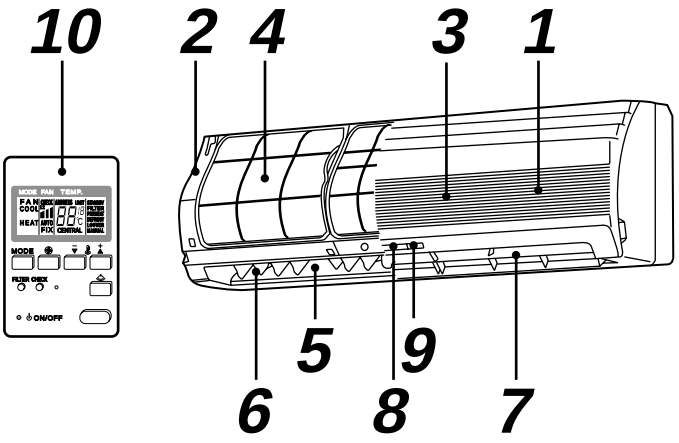
### Outdoor unit

1. **Air outlet - blows off hot air during cooling or cool air during heating**
2. **Power supply box - contains electrical parts**
3. **Earth screw - in the electrical parts box**
4. **Refrigerant line connections**




### Indoor unit

1. **Room temperature sensor**
2. **Front panel**
3. **Air inlet grille**
4. **Air filter**
5. **Air outlet**
6. **Horizontal air flow louver**
7. **Vertical air flow louver**
8. **Display panel**
9. **Infrared signal receiver**
10. **Remote controller**




## NAME AND FUNCTIONS OF INDICATORS AND CONTROLS

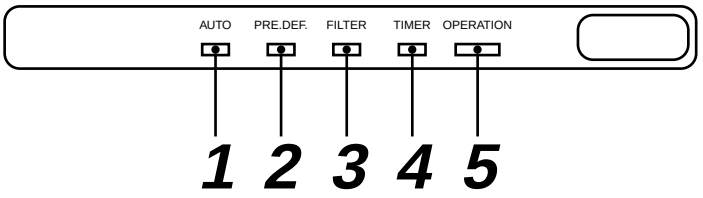
### Display panel

The operating conditions are indicated below.

1. **AUTO (green)**
2. **PRE. DEF. lamp (orange)**
3. **FILTER lamp (orange)**
4. **TIMER lamp (yellow)**
5. **OPERATION lamp (green/*orange)**

   The operation lamp flash rapidly (five times per second), when safety protection feature come into operation.

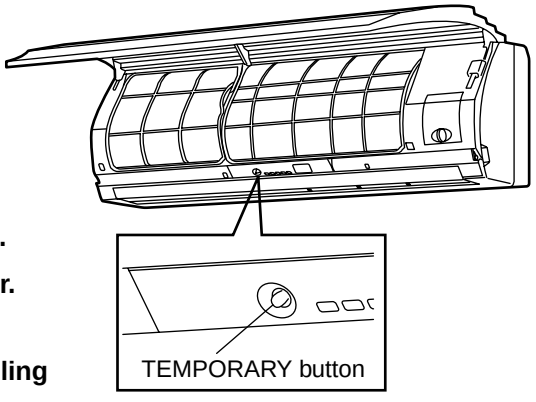
   * When the auto restart function is in operation, the OPERATION lamp is orange.




### TEMPORARY button

If you misplace or lose the remote controller or its batteries are exhausted, push the TEMPORARY button.

1. **Open the air inlet grille to push the TEMPORARY button.**
2. **Push the TEMPORARY button to start the air conditioner. Push this button once again to stop it.**
3. **Continue to push the button for 10 seconds to start cooling operation.**



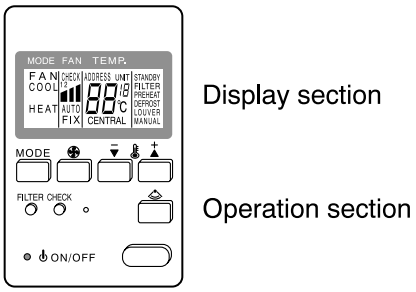
# NAME AND OPERATIONS OF INDICATORS AND CONTROLS

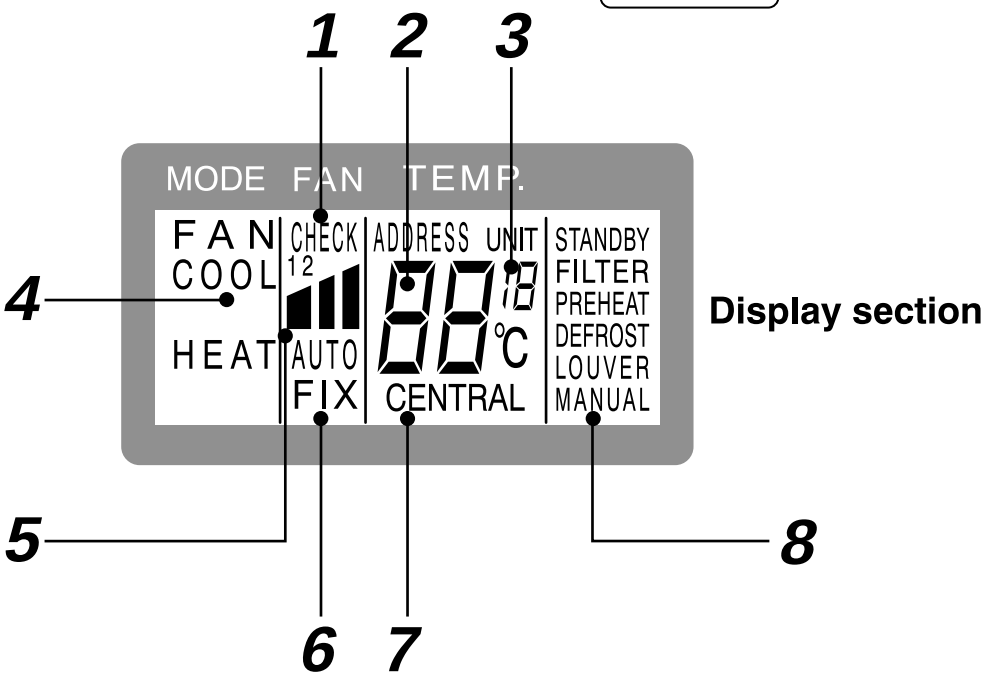
## Display section

All display items are shown in the figure below for purpose of explanation.

Only selected items are displayed in actual operation.
(All indicators are displayed for the explanation.)

The displayed contents differ according to shape or type.




### 1 CHECK

Displayed during check mode.

### 2 Set up temperature display

The selected set up temp. is displayed.

### 3 Unit display

Unit No. in which error/fault is displayed in the set up temp. display section.

### 4 Operation mode display

The selected operation mode is displayed.

### 5 Fan mode display

The selected fan mode is displayed.

(LOW)
(MED.)
(HIGH)

### 6 Air volume fix display

This is not displayed on this model.

### 7 CENTRAL control display

Displayed when used with the central remote controller, etc.

### 8 STANDBY display

It is displayed when the operation cannot be performed though it is not an error.

**FILTER display**

If “FILTER” is displayed, clean the air filter.

**PREHEAT/DEFROST display**

Displayed when heating operation or defrost operation starts.

**LOUVER display**

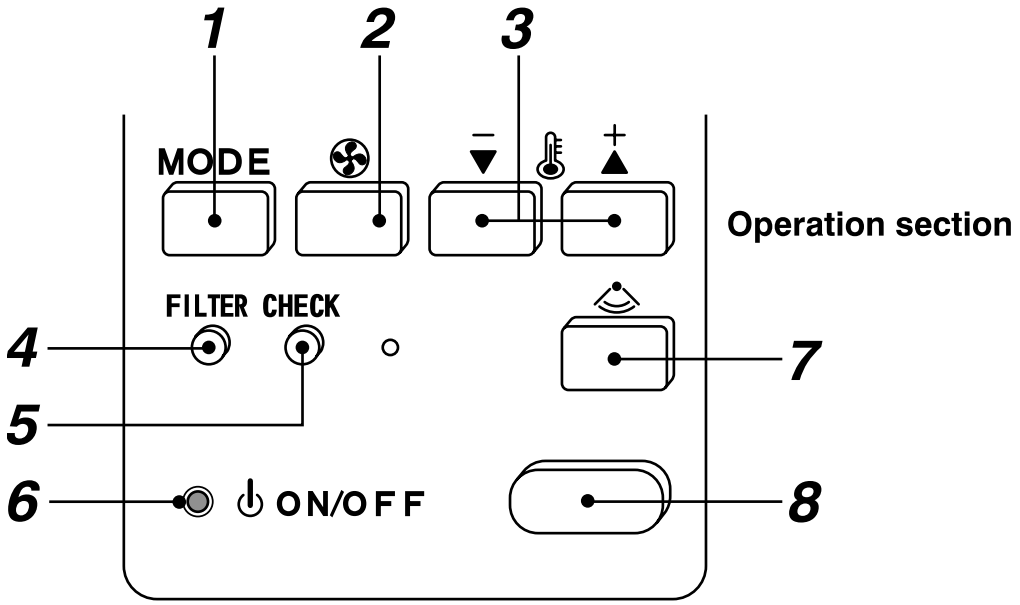
It is displayed while the discharge louver operates in AUTO mode.

**LOUVER/MANUAL display**

It is not displayed on this model.

## Operation section

Push each button to select a desired operation.




**1** **Operation select button**

Selects desired operation mode.

**2** **Air volume select button**

Selects the desired air volume mode

**3** **Set up temp. button**

Adjusts the required room temperature.

Match to the desired set temperature by pushing ▼ ▲.

**4** **Filter reset button**

Resets (Erases) “FILTER” display.

**5** **CHECK button**

When an error/fault occurs on the air conditioner, this button is used to check the check code indicating fault status.

**6** **Operation lamp**

Lamp is lit during the operation.

Lamp is off when stopped.

Although it flashes when power switch is turned on or when turned on again after power failure, it goes on if the operation has started.

**7** **Louver operation button**

With auto louver function, the discharge louver operates or stops during operation of air conditioner.

**8** **ON/OFF button**

When the button is pushed, the operation starts, and it stops by pushing the button again.

When the operation has stopped, the operation lamp and louver display disappear though other displays remain as they are.



## “Central indication”

When using a remote controller connected to a central remote controller, etc., contents which can be operated by the standard remote controller and “CENTRAL” display change by setting at the central remote controller.

| Setup on central remote controller | “CENTRAL” display on standard remote controller | Contents operated by standard remote controller |
|---|---|---|
| Last-push priority (No display) | Goes off | Operated from both standard remote controller and central remote controller, and operated with contents specified later. |
| Center | Goes on | ON / OFF only can be operated. |
| Operation inhibit | Flashes | Cannot be operated. |

For application control using other “Weekly timer” or “Central remote controller” other than this standard remote controller, refer to the Manual attached to each remote controller.

# CORRECT USAGE

When you use the air conditioner at the first time or when you change the setup value, follow the procedure below. From the next time, the operation displayed on the remote controller will start only by pushing ON / OFF button.

## Preparation

### Turn on the power switch.

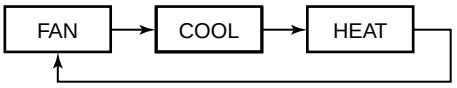
- The operation lamp (Red) flashes.

**REQUIREMENT**

- While using the air conditioner, operate it only with ON/OFF button without turning off the power switch.
- When starting the operation after stop for a long time, turn on the power switch for 12 hours or more before start. (This is required because it is necessary to turn on the compressor case heater for heating in order to prevent overload on the compressor when activating the outdoor unit.)

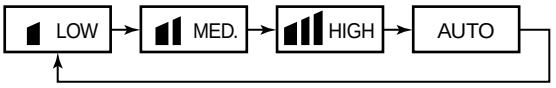
***1*** **Select an operation mode with "MODE" button.**

For every push of the button, the display changes as right figure :




***2*** **Select air volume with the "FAN" button.**

The display changes as follows :

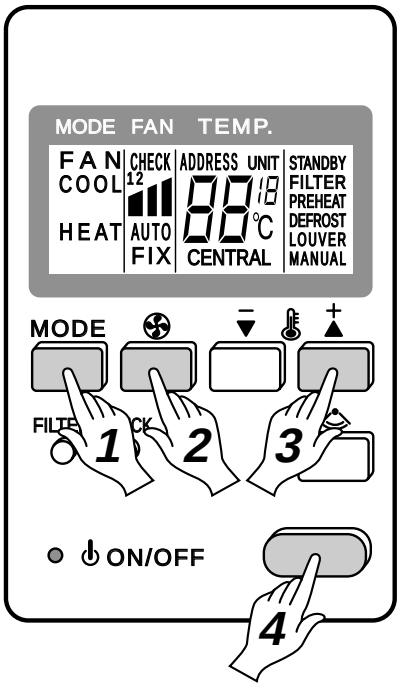



- When air volume is "AUTO", air volume changes according to the room temperature.

***3*** **Determine the set up temperature by pushing the "TEMP." button.**

***4*** **Push "ON/OFF" button.**

The operation lamp goes on, and the operation starts .




## STOP

### Push "ON/OFF" button.

The operation lamp goes off, and the operation stops.

**NOTE**

### In cooling

- When the operation button is pushed, the operation starts approx. 1minute after.

### In heating

- When pushing "ON/OFF" button, the indoor fan starts pre-heating operation for 3 to 5 minutes before it starts blowing out hot air.
- When the room temperature reaches the set up temperature and the outdoor unit stops, the mode becomes LOW and air volume decreases accordingly. During defrost operation, the fan stops so that cool air is not out, and "PREHEAT" and "DEFROST" are displayed.

### When restarting the operation after stop

- In heating operation, the fan operation may continue for approx. 30 second.
- When restarting the operation immediately after stop, the air conditioner does not operate for approx. 3 minutes to protect the machine.

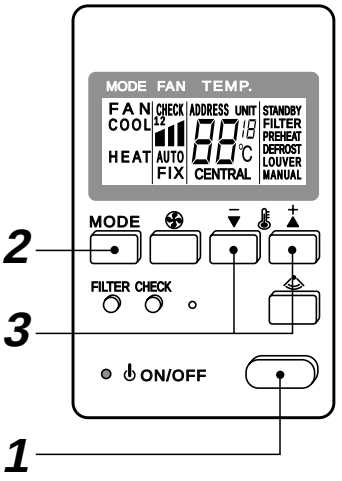
## DRY OPERATION

### Start

**1** **START/STOP button**
Push this button to start the air conditioner.

**2** **Mode select button (MODE)**
Select DRY.

**3** **Temperature button**
Set the desired temperature.



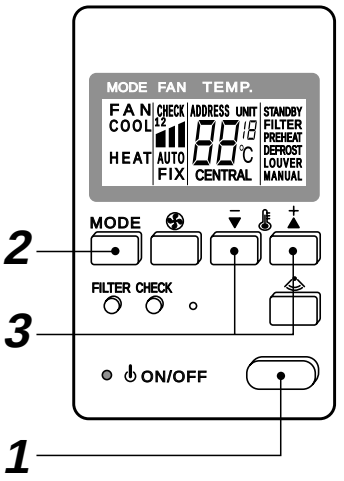

- The FAN speed display indicates AUTO
- The OPERATION lamp (green) on the switch panel of the remote controller lights, and operation starts after approximately 3 minutes.

### Stop

**START/STOP button**
Push this button again to stop the air conditioner.

## AUTOMATIC OPERATION (Auto Changeover)

When you set the air conditioner in A mode or switch over from AUTO operation because of some settings change, it will automatically select either cooling, heating, or fan only operation depending on the outdoor temperature.




### Start

**1** **START/STOP button**
Push this button to start the air conditioner.

**2** **Mode select button (MODE)**
Select Auto.

**3** **Temperature button**
Set the desired temperature.

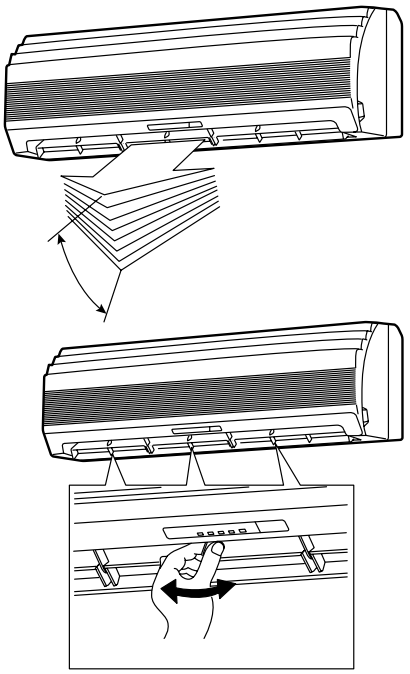
- In case of cooling, it starts the operation after approx. 1 minute.
- In case of heating, the operation mode is selected in accordance with the room temperature and operation starts after approximately 3 to 5 minutes.
- When you select the Auto mode, it is unnecessary to set the fan speed.
  The FAN speed display will show AUTO and the fan speed will be automatically controlled.
- If the Auto mode is uncomfortable, you can select the desired conditions manually.

### Stop

**START/STOP button**
Push this button again to stop the air conditioner.

# ADJUSTING AIR FLOW DIRECTION

- Adjust the air flow direction properly. Otherwise, it might cause discomfort and make the room temperature uneven.
- Adjust the vertical air flow using the remote controller.
- Adjust the horizontal air flow manually.



### Adjust the vertical air flow

The air conditioner automatically adjusts the vertical air flow direction in accordance with the operating conditions.

### To set the air flow direction by yourself

Perform this adjustment when the air conditioner is in operation.

Push the LOUVER button once on the remote controller.

The louver starts to swing. When the desired louver position is reached in the swing, push the LOUVER button again and louver will stop at desired position.

### To automatically swing the air flow direction

Perform this function when the air conditioner is in operation.

Push the LOUVER button on the remote controller.

- To stop the function, push the LOUVER button again.

**CAUTION**

- Do not operate the air conditioner for prolonged periods of time with the air flow direction set downward during cooling operation.
- Do not move the vertical air flow louver manually. Always use the LOUVER button.
  If you move the louver manually, it may malfuction during operation.
  If the louver malfunctions, stop the air conditioner once, and restart.

### Adjust the horizontal air flow

**Preparation :**

- Take hold of the lever on the horizontal air flow louver and move them to adjust the air flow direction as you desire.
- You can adjust the air flow at the left, center, and right locations of the grilles.

# HOW THE AIR CONDITIONER WORKS

### Automatic operation

- The air conditioner selects and operates in one of the operating modes of cooling, heating, or fan only, depending on the room temperature.
- If the AUTO mode is uncomfortable, you can select the desired conditions manually.

| Room temperature in operation | Operating condition | |
|---|---|---|
| The set temperature +1°C or higher (in case that the room is hot) | Cooling operation | Performs the cooling operation at a temperature 1°C higher than the setting. |
| The set temperature –1°C to +1°C | Fan only operation | Performs the fan only operation (low speed) while monitoring the room temperature. When the room temperature changes, the air conditioner will select the cooling or heating mode. |
| The set temperature –1°C or lower (in case the room is cold) | Heating operation | Performs the heating operation at a temperature 1°C lower than the setting. |

## HINTS FOR ECONOMICAL OPERATION

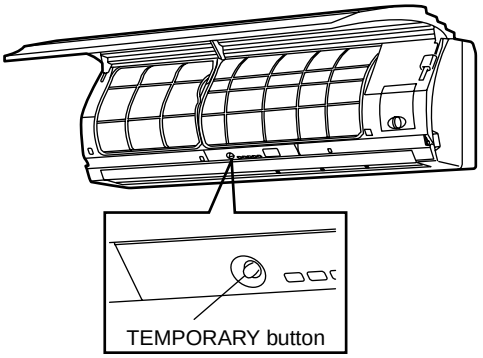
1. **Clean air filters**
   Air flow and performance are reduced if the air filters become blocked.
   Clean them every 2 weeks..
2. **Never open doors and windows more often than necessary**
   To keep cool or warm air in the room, never open doors and windows more often than necessary.
3. **Use the timer effectively**
   Set the timer for the desired operating time.
4. **Allow uniform circulation of room air**
   Adjust the air flow direction for the even circulation of room air.

# TEMPORARY OPERATION

### TEMPORARY operation

This function is used to operate the unit temporally in case you misplace the remote controller or its batteries are exhausted.

- Push the TEMPORARY button to start the air conditioner.
- While the substitute operation is set, the remote controller operation is disabled.
- Continue to push the button for 10 seconds to start cooling operation.




### Air filter reset

When the FILTER lamp on the air conditioner is indicated, it is time for cleaning. (The lamp will start to indicate, after every 1000 hours of operation.)

- The FILTER lamp will be out when the TEMPORARY button is pushed.
- The FILTER lamp will also be out when the FILTER button on the remote controller is pushed.

# MAINTENANCE

**WARNING**

Before you clean the air conditioner be sure to turn off the circuit breaker or main power switch.

### Cleaning of indoor unit and remote controller

**CAUTION**

- Use a dry cloth to wipe the indoor unit and remote controller.
- A cloth dampened with cold water may be used on the indoor unit if it is very dirty.
- Never use a damp cloth on the remote controller.
- Do not use a chemically-treated duster for wiping or leave such materials on the unit for long. It may damage or fade the surface of the unit.
- Do not use benzine, thinner, polishing powder, or similar solvents for cleaning. These may cause the plastic surface to crack or deform.

### If the air conditioner is not to be used for more than one month

1. Operate the air conditioner in FAN ONLY mode for approximately 6 hours to dry inside the unit
2. Stop the air conditioner and turn off the circuit breaker.
3. Remove the batteries from the remote controller.

## Check before operation

**CAUTION**

- Check that the air filters are installed.
- Check that the air outlet or inlet of the outdoor unit is not blocked.

### Cleaning the air filter

Clean the air filters every 2 weeks.

If the air filters are covered with dust, the performance of the air conditioner will deteriorate.

### Clean the air filters as often as possible.

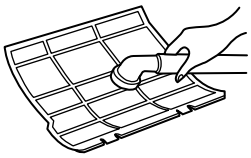
***1*** **Open the air inlet grille.**

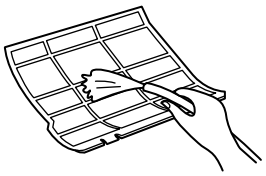
Lift the air inlet grille up to the horizontal position.

***2*** **Take hold of the left and right handles of the air filter and lift it up slightly, then pull it downward to take it out from the filter holder.**

***3*** **Remove the filters.**

***4*** **Use a vacuum cleaner to remove the dust from the filters or wash them with water. If you wash the air filters, dry them in the shade.**



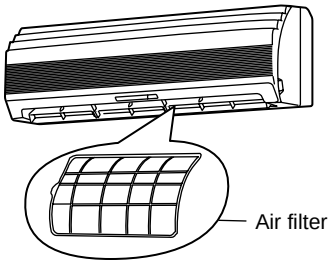


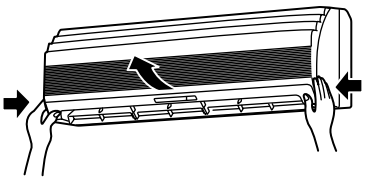
***5*** **Insert the upper portion of the air filter aligning right and left edges on the indoor unit until correctly positioned.**

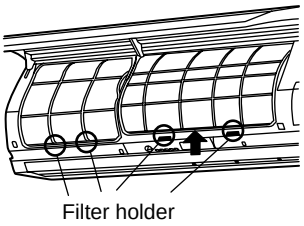
***6*** **Close the air inlet grille.**

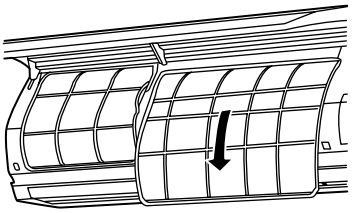
* If the filter lamp on the indoor unit is indicated, push the FILTER button on the remote controller or the TEMPORARY button on the indoor unit to turn off the lamp.

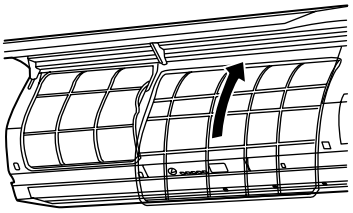
## FAN ONLY Operation

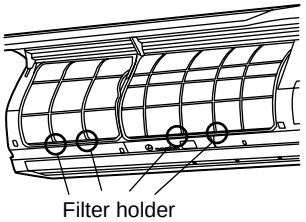






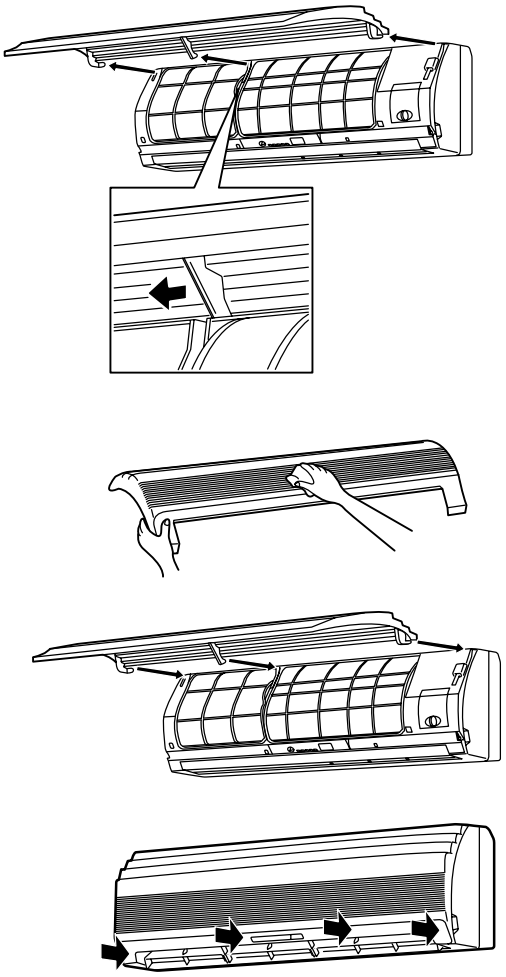


### Cleaning the air inlet grille

1. Remove the air inlet grille.

   Hold the both sides of the air inlet grille and open upward.

   Move the center arm to the left and remove the grille.
2. Wash it with water using a soft sponge or towel. (Do not use metallic scrubbing brush or other hard brushes.)
   - Use of such hard objects will cause scratches on the surface of the air inlet grille, and the coating to peel off.
   - If very dirty, clean the air inlet grille with a neutral detergent, and rinse it off with water after removing it from the unit.
3. Wipe out water from the air inlet grille and dry.
4. Fit the left and right arms of the air inlet grille to the shafts on the two sides of the air conditioner and push in completely, and then push in the center arm.
5. Check that the center arm has been completely inserted and close the air inlet grille.
   - Push the arrow locations (four) at the bottom of the air inlet grille to check whether the grille is completely closed.



## AIR CONDITIONER OPERATIONS AND PERFORMANCE

### 3 minute protection function

A protection feature prevents the air conditioner from being activated for approximately 3 minutes when it is restarted immediately after operation or when the power supply switch is turned on. This will protect the machine.

### Heating operation characteristics

### Preheating operation

The air conditioner will not deliver warm air immediately after it is started.

Warm air flows out after approximately 5-minutes when the indoor heat exchanger warms up.
(The PRE.-DEF. lamp is on during the preheating operation.)

### Warm air control

When the room temperature reaches the set temperature, the indoor fan speed is automatically reduced to prevent cold draft.

The outdoor unit will stop.

### Defrosting

If the outdoor unit is frosted during heating operation, defrosting is started automatically (for approximately 5 to 10 minutes). To maintain the heating effect, the PRE.-DEF. lamp is on.

- The fans on the indoor and outdoor units stop during the defrost operation.
- During defrost operation, defrosted water drains from the bottom plate of the outdoor unit.

### Heating capacity

If the outdoor temperature is too low, it is recommended that additional heating appliances be used in conjunction with the air conditioner.

### Power failure

Power failure during operation will stop the unit completely.

- The OPERATION lamp (green) on the indoor unit will start flashing when power is restored.
- To restart operation, push the START/STOP button on the remote controller.

### Air conditioner operating conditions

For proper performance, operate the air conditioner in the following temperature conditions:

| | | |
|---|---|---|
| Cooling operation | Outdoor temperature | : –5°C to 43°C |
| | Room temperature | : 18°C to 32°C |
| | **CAUTION** Room relative humidity – less than 80 %. If the air conditioner operates in excess of this figure, the surface of the air conditioner may cause dewing. | |
| Heating operation | Outdoor temperature | : –15°C to 21°C |
| | Room temperature | : Less than 30°C |

If air conditioner is used outside of the above conditions, safety protection may work.

## PROBLEMS AND CAUSES

**CAUTION**

If any of the following conditions occur, turn off the main power supply switch and immediately contact the dealer :

- The indicator lamps flash at short intervals (5 Hz) even though you have tried turning off the power supply and turning on again after 2 to 3 minutes.
- Switch operation is erratic.
- The main power fuse often blows out, or the circuit breaker is often activated.
- A foreign matter or water has fallen into the inside of the air conditioner.
- Any other unusual condition is observed.

**Before you ask for servicing or repairs, check the following points.**

### Recheck

#### Inoperative

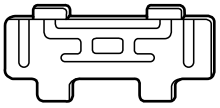
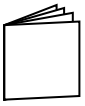
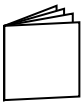
- The main power switch is turned off.
- The circuit breaker is activated to cut off power supply.
- The main power fuse is blown.
- ON timer is set.

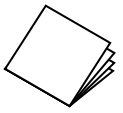
#### Does not cool well or heat well

- The air inlet or outlet of the outdoor unit is blocked.
- Doors or windows are opened.
- The air filter is blocked with dust.
- The louver is not at the correct position.
- The fan speed is set too low.
- The set temperature is too high. (In cooling operation)
- The set temperature is too low. (In heating operation)

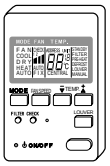
# Accessory parts and Parts to be procured locally

## ❒ Accessory parts

| Part name | Q'ty | Shape |
|---|---|---|
| Installation plate | 1 |  |
| Installation Manual | 1 |  |
| Owner's Manual | 1 |  |

| Part name | Q'ty | Shape |
|---|---|---|
| Mounting screw Ø4mm x 25mm | 8 | |
| Pattern paper | 1 |  |

**<Separate sold parts>**

| Part name | Q'ty | Shape |
|---|---|---|
| Wired remote controller | 1 |  |

## ❒ Parts to be procured locally

| |
|---|
| Connecting pipe (Liquid side)<br>(6.35mm (diam.), Nominal (diam.) 1/4" thick 0.8mm)<br>RAV-SM560KRT-E, RAV-SM560AT-E<br>(9.52mm (diam.), Nominal (diam.) 3/8" thick 0.8mm)<br>RAV-SM800KRT-E, RAV-SM800AT-E |
| Connecting pipe (Gas side)<br>(12.7mm (diam.), Nominal (diam.) 1/2" thick 0.8mm)<br>RAV-SM560KRT-E, RAV-SM560AT-E<br>(15.9mm (diam.), Nominal (diam.) 5/8" thick 1.0mm)<br>RAV-SM800KRT-E, RAV-SM800AT-E |
| Power supply cord<br>2.5mm² (H07RN-F or 245IEC66) or 3.5mm² (AWG-12) |

| |
|---|
| Connecting cable<br>H07RN-F or 245IEC66 (1.0mm² or more) |
| Thermal insulation for refrigerant pipe<br>(10mm or more, thermal insulating foam polyethylene) |
| Thermal insulation for drain pipe<br>(10mm or more, foam polyethylene) |
| Drain pipe (Outer 26mm (diam.)) |
| Tapes |
| Grounding cable (2.0mm (diam.) or more) |

# 1 PRECAUTIONS FOR SAFETY

- Ensure that all Local, National and International regulations are satisfied.
- Read this “PRECAUTIONS FOR SAFETY” carefully before Installation.
- The precautions described below include the important items regarding safety. Observe them without fail.
- After the installation work, perform a trial operation to check for any problem.
  Follow the Owner’s Manual to explain how to use and maintain the unit to the customer.
- Turn off the main power supply switch (or breaker) before the unit maintenance.
- Ask the customer to keep the Installation Manual together with the Owner’s Manual.

**CAUTION** **New Refrigerant Air Conditioner Installation**

- **THIS AIR CONDITIONER ADOPTS THE NEW HFC REFRIGERANT (R410A) WHICH DOES NOT DESTROY OZONE LAYER.**

The characteristics of R410A refrigerant are ; easy to absorb water, oxidizing membrane or oil, and its pressure is approx. 1.6 times higher than that of refrigerant R22. Accompanied with the new refrigerant, refrigerating oil has also been changed. Therefore, during installation work, be sure that water, dust, former refrigerant, or refrigerating oil does not enter the refrigerating cycle.

To prevent charging an incorrect refrigerant and refrigerating oil, the sizes of connecting sections of charging port of the main unit and installation tools are charged from those for the conventional refrigerant.

Accordingly the exclusive tools are required for the new refrigerant (R410A).

For connecting pipes, use new and clean piping designed for R410A, and please care so that water or dust does not enter. Moreover, do not use the existing piping because there are problems with pressure-resistance force and impurity in it.

**CAUTION** **To Disconnect the Appliance from Main Power Supply.**

This appliance must be connected to the main power supply by means of a switch with a contact separation of at least 3 mm.

**The installation fuse (25A D type ) must be used for the power supply line of this conditioner.**

**⚠ WARNING**

- **Ask an authorized dealer or qualified installation professional to install/maintain the air conditioner.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **Turn off the main power supply switch or breaker before attempting any electrical work.**
  Make sure all power switches are off. Failure to do so may cause electric shock.
- **Connect the connecting cable correctly.**
  If the connecting cable is connected in a wrong way, electric parts may be damaged.
- **When moving the air conditioner for the installation into another place, be very careful not to enter any gaseous matter other than the specified refrigerant into the refrigeration cycle.**
  If air or any other gas is mixed in the refrigerant, the gas pressure in the refrigeration cycle becomes abnormally high and it may resultingly causes pipe burst and injuries on persons.
- **Do not modify this unit by removing any of the safety guards or by by-passing any of the safety interlock switches.**
- **Exposure of unit to water or other moisture before installation may cause a short-circuit of electrical parts.**
  Do not store it in a wet basement or expose to rain or water.

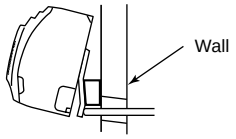
# 1 PRECAUTIONS FOR SAFETY

- **After unpacking the unit, examine it carefully if there are possible damage.**
- **Do not install in a place that might increase the vibration of the unit.**
- **To avoid personal injury (with sharp edges), be careful when handling parts.**
- **Perform installation work properly according to the Installation Manual.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **When the air conditioner is installed in a small room, provide appropriate measures to ensure that the concentration of refrigerant leakage occur in the room does not exceed the critical level.**
- **Install the air conditioner securely in a location where the base can sustain the weight adequately.**
- **Perform the specified installation work to guard against an earthquake.**
  If the air conditioner is not installed appropriately, accidents may occur due to the falling unit.
- **If refrigerant gas has leaked during the installation work, ventilate the room immediately.**
  If the leaked refrigerant gas comes in contact with fire, noxious gas may generate.
- **After the installation work, confirm that refrigerant gas does not leak.**
  If refrigerant gas leaks into the room and flows near a fire source, such as a cooking range, noxious gas might generate.
- **Electrical work must be performed by a qualified electrician in accordance with the Installation Manual. Make sure the air conditioner uses an exclusive power supply.**
  An insufficient power supply capacity or inappropriate installation may cause fire.
- **Use the specified cables for wiring connect the terminals securely fix. To prevent external forces applied to the terminals from affecting the terminals.**
- **Be sure to provide grounding.**
  Do not connect ground wires to gas pipes, water pipes, lightning rods or ground wires for telephone cables.
- **Conform to the regulations of the local electric company when wiring the power supply.**
  Inappropriate grounding may cause electric shock.
- **Do not install the air conditioner in a location subject to a risk of exposure to a combustible gas.**
  If a combustible gas leaks, and stays around the unit, a fire may occur.

# 2 INSTALLATION PROCEDURE

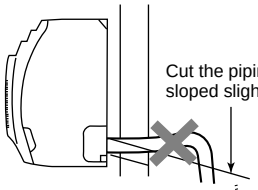
## Installation Diagram of Indoor Unit

For rear left and side pipe exit

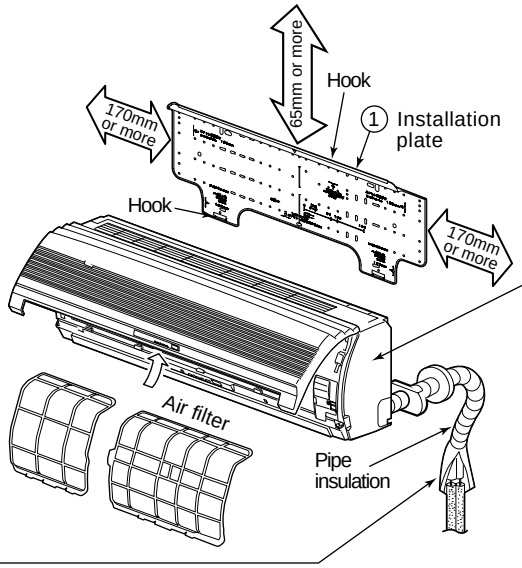



Insert the cushion between the indoor unit and wall, and lift indoor unit to make work easier.

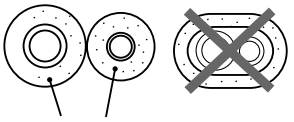
Do not allow the drain hose to sag.



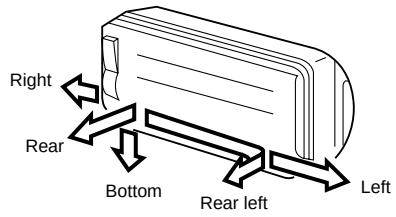

Make sure to run the drain hose sloped downward.




Insulate the refrigerant pipes separately with insulation, not together.

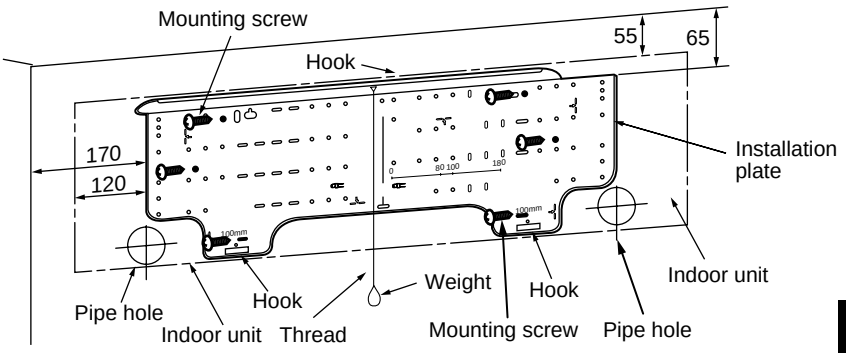



The auxiliary piping can be connected the left, rear left, rear, right or bottom.




## Mounting the Installation Plate

For installation of the indoor unit, use the paper template included.

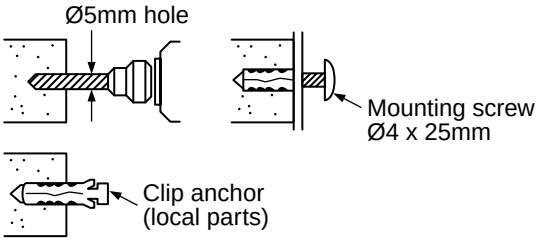


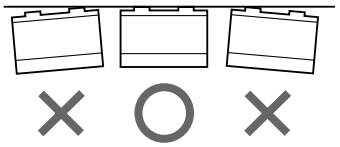

**When the installation plate is directly mounted on the wall**

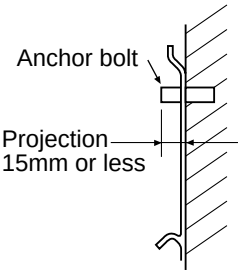
1. Securely fix the installation plate to the wall by screwing it through the upper and lower fixing holes.
2. To mount the installation plate on a concrete wall with anchor bolts, utilize the anchor bolt holes as illustrated in the above figure.
3. Attach the installation plate horizontally to the wall.

**CAUTION**

When installing the installation plate with mounting screw, do not use the anchor bolt hole.
Otherwise the unit may fall down and result in personal injury and property damage.






RAV-SM560KRT-E
RAV-SM800KRT-E

# 3 SELECTION OF INSTALLATION PLACE

**⚠ WARNING**

- **Install the air conditioner where there is sufficient strength to withstand the weight of the unit.**
  If the strength is not sufficient, the unit may fall down resulting in injury.

**⚠ CAUTION**

**Upon approval of the customer, install the air conditioner in a place that satisfies the following conditions.**

- Place where the unit can be installed horizontally.
- Place where a sufficient servicing space can be ensured for safe maintenance and check.
- Place where drained water will not cause any problem.

**Avoid installing in the following places.**

- Place exposed to air with high salt content (seaside area), or place exposed to large quantities of sulfide gas (hot spring). (Should the unit be used in these places, special protective measures are needed.)
- Place exposed to oil, vapor, oil smoke or corrosive gas.
- Place where organic solvent is used nearby.
- Place close to a machine generating high frequency.
- Place where the discharged air blows directly into the window of the neighboring house. (For outdoor unit)
- Place where noise of the outdoor unit is easy to transmit.
  (When installing the air conditioner on the boundary with the neighbor, pay due attention to the level of noise.)
- Place with poor ventilation.
- Where the ceiling height is more than 3m.
- Where the floor/wall/ceiling structure is unable to support the weight of the unit.

# 4 INSTALLATION OF INDOOR UNIT



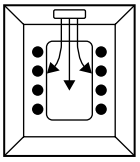
**⚠ WARNING**

- **Install the air conditioner certainly at a place to sufficiently withstand the weight.**
  If the strength is insufficient, the unit may fall down resulting in human injury.
- **Perform a specified installation work to guard against an earthquake.**
  An incomplete installation can cause accidents by the units falling and dropping.

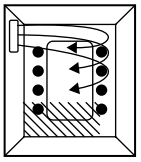
Locate the unit so as to provide uniform circulation of chilled air.

Avoid locating the unit as shown in the bad-marked figures below :

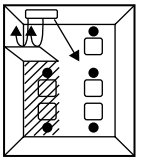
Good location
Evenly hot or cooled



Bad location
Shaded area well hot or cooled



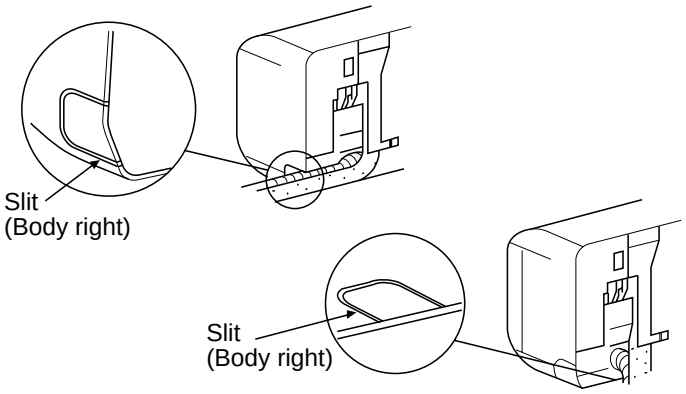
Bad location
Shaded area well hot or cooled



If a good location is not possible, use a fan to circulate the air evenly throughout the room.

# 5 DRAIN PIPING WORK

## Piping and Drain Hose Installation




### In case of right-side exit

- Cut out the knockout portion by the slits with a knife or pair of wire cutters as necessary.

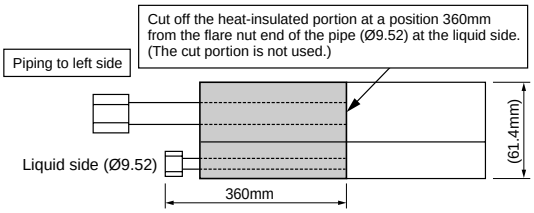
### In case of downward pipe exit

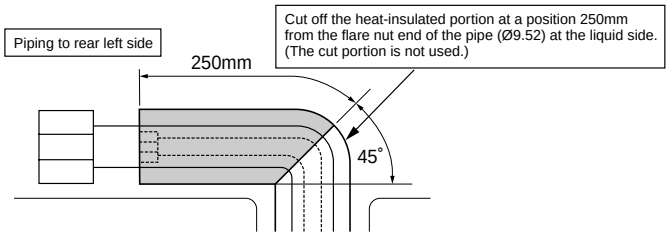
- Cut out the knockout portion by the slits with a knife or pair of wire cutters as necessary.

### In case of left-side connection

When piping the refrigerant pipe and drain pipe at the left side or at the rear left side, follow the procedure below. (An incomplete piping may cause lifting-out of the main unit form the wall surface.)

1. Using a cutter, etc., cut off the portion of the connecting pipe, which is applied with heat-insulator. (In this time, be sure not to damage the pipe.)


Cut off the heat-insulated portion at a position 360mm from the flare nut end of the pipe (Ø9.52) at the liquid side. (The cut portion is not used.)
Piping to left side
Liquid side (Ø9.52)
(61.4mm)
360mm


Piping to rear left side
Cut off the heat-insulated portion at a position 250mm from the flare nut end of the pipe (Ø9.52) at the liquid side. (The cut portion is not used.)
250mm
45°

2. After connection of the pipes, apply heat insulation to the naked pipes with the shield pipes (Accessory) (Length: 360mm).

   In the case of piping at the rear left side, cut off the shield pipe (Accessory) by 250mm.

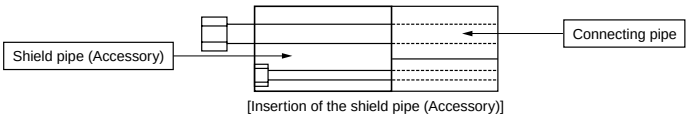
   Connect the pipes so that pipe at gas side (Ø15.88 side) is set at the upper side. (See the figure at the right.)

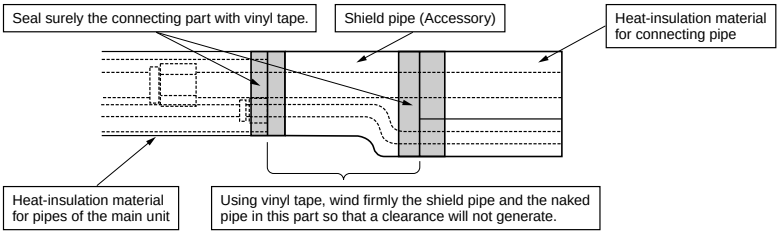
**NOTE :**

Using vinyl tape, seal surely the heat-insulated portions of the main unit and the connecting pipes.

In order to prevent the water leak, set the slit portion of the shield pipe upward and apply sealing.

Wind firmly the shield pipe and the naked pipe with the vinyl tape so that a clearance will not generate. (Do not use the other heat-insulation material than the shield pipe (Accessory) for heat-insulation of the naked pipes.)

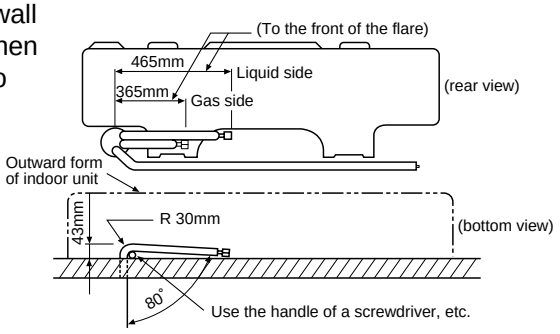




Seal surely the connecting part with vinyl tape.
Shield pipe (Accessory)
Heat-insulation material for connecting pipe
Heat-insulation material for pipes of the main unit
Using vinyl tape, wind firmly the shield pipe and the naked pipe in this part so that a clearance will not generate.

- Bend the connecting pipe so that it is laid within 43mm above the wall surface. If the connecting pipe is laid exceeding 43mm above the wall surface, the indoor unit could be unstable when set on the wall. When bending the connecting pipes, always use a suitable bending tool to avoid damaging the pipes.

**Bend the connection pipe within a radius of 30mm.**

**To connect the pipe after installation of unit (figure)**




**NOTE :**

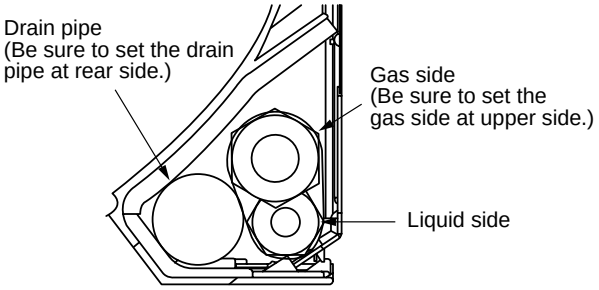
If the pipe is bent incorrectly, the indoor unit could be unstable on the wall.

After passing the connecting pipe through the pipe hole, connect the connecting pipe to the auxiliary pipes and insulate as necessary.

# 5 DRAIN PIPING WORK

**CAUTION**

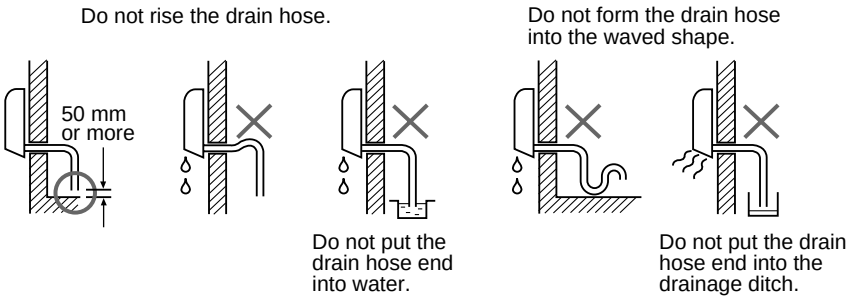
- Bind the auxiliary pipes (two) and connecting cable with tape tightly. In case of left-side pipe exit and rear-left exit, bind the auxiliary pipes (two) only with facing tape.



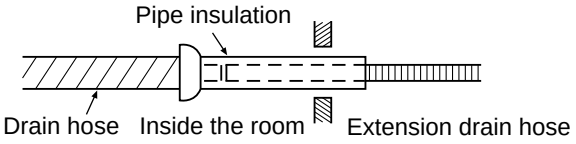

- Carefully arrange pipes so that any pipe does not stick out of the rear plate of the indoor unit.
- Carefully connect the auxiliary pipes and connecting pipes to each other and cut off the insulating tape wound on the connecting pipe to avoid double-taping at the joint, then seal the joint with vinyl tape, etc.
- In order to reduce the possibility of condensed water being produced within the indoor unit, make sure to insulate both the connecting pipes.
  (Use a suitable form of insulation material specifically design designed for refrigeration pipe work.)
- When bending a pipe, ensure care is taken to prevent pipe damage.

## Drainage

1. Run the drain hose sloped downwards.


Do not rise the drain hose.
Do not form the drain hose into the waved shape.
50 mm or more
Do not put the drain hose end into water.
Do not put the drain hose end into the drainage ditch.

2. It is not possible to add water to the drain pan to confirm correct drainage. To do this, the unit must be operated in the COOL mode.
3. When connecting extension drain hose, insulate the connecting part of extension drain hose with pipe insulation.

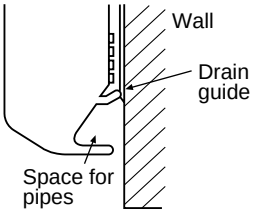



**CAUTION**

Arrange the drain pipe to allow proper drainage from the unit. Incorrect drainage can result in condensation problems.

This structure of this air conditioner is designed condensed water, which may form on the back of the indoor unit, into the drain pan.

Therefore, do not store the power cables and other parts within the drain guide.



# 6 REFRIGERANT PIPING

## Refrigerant Piping

1. If the outdoor units are to be mounted on a wall, make sure that the platform supporting is sufficiently strong. The platform should be designed and manufactured to maintain its strength over a long period of time, and sufficient consideration should be given to ensuring that the outdoor unit will not fall.
2. **Use copper pipe with 0.8 mm or more thickness.**
3. Flare nut and flare works are also different from those of the conventional refrigerant. Take out the flare nut attached to the main unit of the air conditioner, and use it.

**CAUTION**

**IMPORTANT 4 POINTS FOR PIPING WORK**

1. Take away dust and moisture from the inside of the connecting pipes.
2. Tight connection (between pipes and unit)
3. Evacuate the air in the connecting pipes using VACUUM PUMP.
4. Check the gas leakage. (Connected points)

## Permissible Piping Length and Head

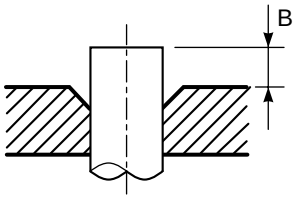
| The maximum piping length from the outdoor to indoor unit | | The maximum height difference outdoor/indoor unit | |
|---|---|---|---|
| | | Outdoor unit is above | Outdoor unit is below |
| 30 m (Without charge 20m) (RAV-SM560AT-E) | 50 m (Without charge 20m) (RAV-SM800AT-E) | 30m | 15m |

### Flaring

Insert a flare nut into the pipe, and flare the pipe.

As the flaring sizes of R410A differ from those of refrigerant R22, the flare tools newly manufactured for R410A are recommended.

However, the conventional tools can be used by adjusting projection margin of the copper pipe.




**• Projection margin in flaring : B (Unit : mm)**

Rigid (Clutch type)

| Outer diam. of copper pipe | R410A tool used | | Conventional tool used | |
|---|---|---|---|---|
| | R410A | R22 | R410A | R22 |
| 6.35 | 0 to 0.5 | (Same as left) | 1.0 to 1.5 | 0.5 to 1.0 |
| 9.52 | 0 to 0.5 | (Same as left) | 1.0 to 1.5 | 0.5 to 1.0 |
| 12.7 | 0 to 0.5 | (Same as left) | 1.0 to 1.5 | 0.5 to 1.0 |

Imperial (Wing nut type)

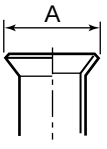
| Outer diam. of copper pipe | R410A | R22 |
|---|---|---|
| 6.35 | 1.5 to 2.0 | 1.0 to 1.5 |
| 9.52 | 1.5 to 2.0 | 1.0 to 1.5 |
| 12.7 | 2.0 to 2.5 | 1.5 to 2.0 |

**• Flaring dia meter size : A (Unit : mm)**

| Outer diam. of copper pipe | $A^{+0}_{-0.4}$ | |
|---|---|---|
| | R410A | R22 |
| 6.35 | 9.1 | 9.0 |
| 9.52 | 13.2 | 13.0 |
| 12.7 | 16.6 | 16.2 |

* In the case of flaring for R410A with the conventional flare tool, pull out it approx. 0.5 mm more than that for R22 to adjust to the specified flare size.

The copper pipe gauge is useful for adjusting projection margin size.



# 6 REFRIGERANT PIPING

### Tightening connection

Align the centers of the connecting pipes and tighten the flare nut as far as possible with your fingers. Then tighten the nut with a spanner and torque wrench as shown in the figure.

**CAUTION**

- Do not apply excess torque. Otherwise, the nut may crack depending on the conditions.

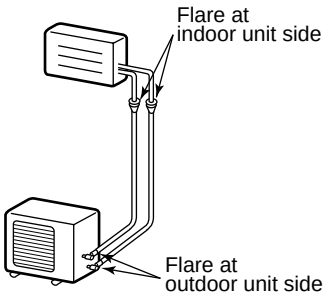
(Unit : N•m)

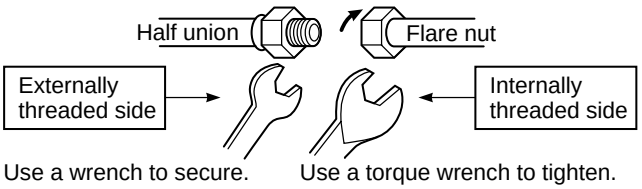
| Outer diam. of copper pipe | Tightening torque |
|---|---|
| 6.35 mm (diam.) | 14 to 18 (1.4 to 1.8 kgf•m) |
| 9.52 mm (diam.) | 33 to 42 (3.3 to 4.2 kgf•m) |
| 12.7 mm (diam.) | 50 to 62 (5.0 to 6.2 kgf•m) |
| 15.9 mm (diam.) | 63 to 77 (6.3 to 7.7 kgf•m) |

- **Tightening torque of flare pipe connections**

  Pressure of R410A becomes higher than that of R22. (Approx. 1.6 times) Therefore, using a torque wrench, tighten firmly the flare pipe connecting sections which connect the indoor and outdoor units up to the specified tightening torque.

  Incorrect connections may cause not only a gas leakage, but also a trouble of the refrigeration cycle or compressor damage.




# 7 EVACUATING

**AIR PURGE**

Evacuate the air in the connecting pipes and in the indoor unit using vacuum pump.
Do not use the refrigerant in the outdoor unit.
For details, see the manual of vacuum pump.

### Use a vacuum pump

Be sure to use a vacuum pump with counter-flow prevention function so that inside oil of the pump does not flow backward into pipes of the air conditioner when the pump stops.

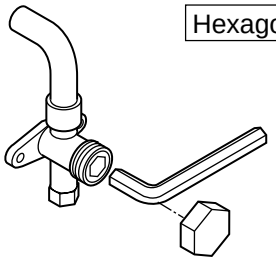
1. Connect the charge hose from the manifold valve to the service port of the gas side packed valve.
2. Connect the charge hose to the port of vacuum pump.
3. Open fully the low pressure side handle of the gauge manifold valve.
4. Operate the vacuum pump to start for evacuating.

   Perform evacuating for about 35 minutes if the piping length is total 30 meters for model SM560 and 50 meters for model SM800.
   (assuming a pump capacity of 27 liters per minute.)
   Then confirm that the compound pressure gauge reading is –101 kPa ( –76 cmHg).
5. Close the low pressure side valve handle of gauge manifold.
6. Open fully the valve stem of the packed valves (both sides of Gas and Liquid).
7. Remove the charging hose from the service port.
8. Securely tighten the caps on the packed valves.

## Packed valve handling precautions

- Open the valve stem all the way out ; do not try to open it beyond the stopper.
- Securely tighten the valve stem cap in torque as follows:

| | |
|---|---|
| Gas side (12.7 mm (diam.)) | 50 to 62 N•m (5.0 to 6.2 kgf•m) |
| Gas side (9.52 mm (diam.)) | 33 to 42 N•m (3.3 to 4.2 kgf•m) |
| Liquid side (6.35 mm (diam.)) | 14 to 18 N•m (1.4 to 1.8 kgf•m) |
| Service port | 14 to 18 N•m (1.4 to 1.8 kgf•m) |

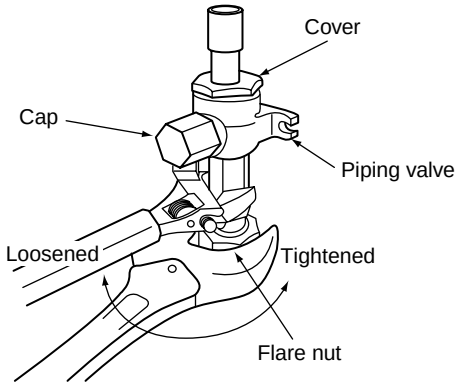


Hexagonal wrench is required.

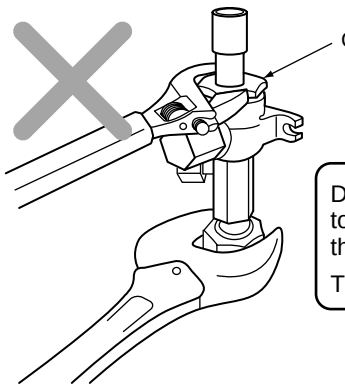
### <For RAV-SM800AT-E model>

- As shown in the figure, be sure to use a double spanner to loosen or tighten the flare nut of the valve at gas side. If using a single spanner, the nut cannot be tightened with necessary tightening torque.

  On the contrary, use a single spanner to loosen or tighten the flare nut of the valve at liquid side.



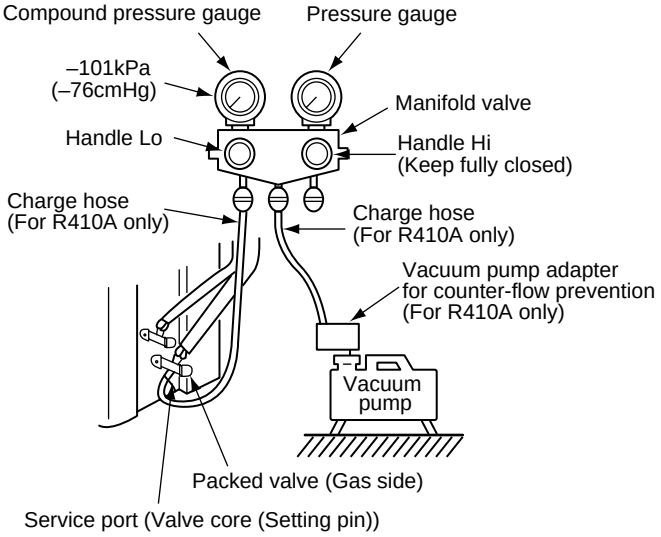

**SM800 type valve at gas side**

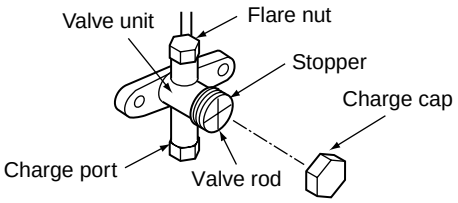



Do not put the spanner or torque wrench, etc. on the cover.

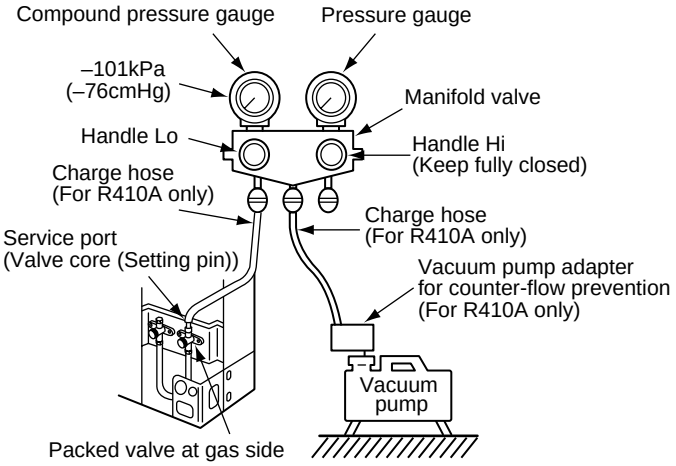
The valve may be broken.

### <For RAV-SM560AT-E model>

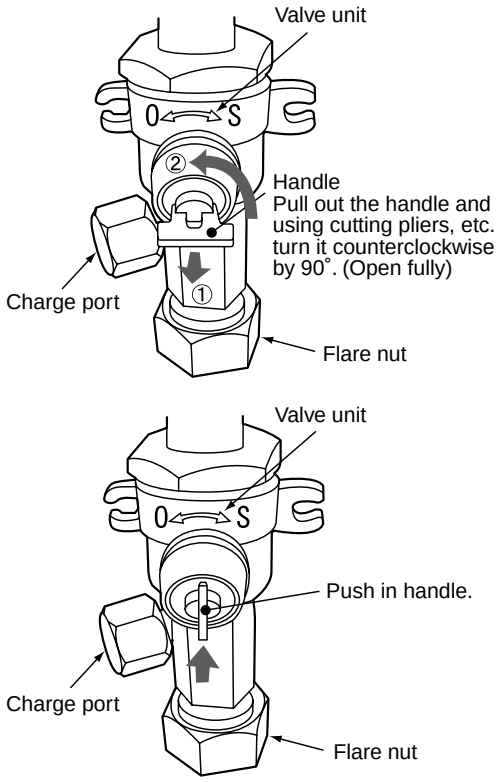


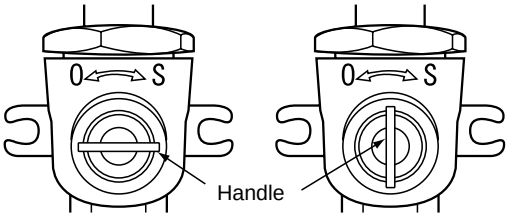

### <For RAV-SM800AT-E model>



# 7 EVACUATING




**Handle position**




Opened fully  Closed completely

*1. Use the vacuum pump, vacuum pump adapters, and gauge manifold referring to the manuals attached to each tool before using them. For the vacuum pump, check oil is filled up to the specified line of the oil gauge.

*2. While the air is purged, check again that the connecting port of charge hose, which has a projection to push the valve core, is firmly connected to the charge port.

**Valve handling precautions**

- Open the valve stem or the handle until it strikes the stopper. It is unnecessary to apply further force.
- Securely tighten the cap with a torque wrench.
- Cap tightening torque

| | | |
|---|---|---|
| **Valve size** | Ø6.4 | 14 to 18N•m (1.4 to 1.8kgf•m) |
| | Ø9.5 | 33 to 42N•m (3.3 to 4.2kgf•m) |
| | Ø12.7 | 33 to 42N•m (3.3 to 4.2kgf•m) |
| | Ø15.9 | 20 to 25N•m (2.0 to 2.5kgf•m) |
| **Charge port** | | 14 to 18N•m (1.4 to 1.8kgf•m) |

## Additional refrigerant

1. The amount of refrigerant put into the outdoor unit at the factory is sufficient to fill up to 20m of refrigerant piping work.
2. If the length of the refrigerant piping work is 20m or less, addition of refrigerant at the installation site is unnecessary.
3. If the length of the piping work exceeds 20m, extra refrigerant must be added. Refer to the outdoor installation manual for details of the extra amounts.
4. Overcharge or undercharge of refrigerant in the outdoor unit may cause malfunction of the compressor.

**Add Only R410A Refrigerant to These Units**

## Heat insulation

1. Provide heat insulation on the refrigerant piping on both the liquid side and gas side separately, and ensure that all joints in the insulation are compleatly sealed (without gap).
2. Since the temperature of the piping on the gas side increases during heating operations, the heat insulating material used must be able to withstand temperatures of more than 120°C.
3. Use the pipe insulation supplied in the accessory pack to insulate the piping connecting section on the indoor unit side.

# 8 ELECTRICAL WORK

For the air conditioner that has no power cord.

**NOTE:**

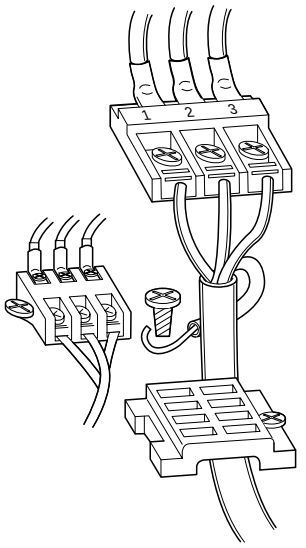
For selection and connection method of the power supply cords, refer to the details in the Installation Manual of the outdoor unit.

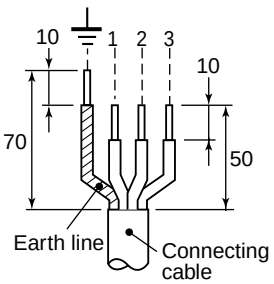
## CAUTIONS

- If incorrect/incomplete wiring is carried out, it may cause an electrical fire or smoke.
- Prepare the power supply for exclusive use with the air conditioner.
- Be sure to use the cord clamps specified positions with attached to the product.
- Do not damage or scratch the conductive core and inner insulator of power and inter-connecting cables when peeling them.
- Be sure to comply with local cords on running the wire from outdoor unit to indoor unit (size of wire and wiring method etc.)
- Use the power cord and Inter-connecting cable with specified thickness, specified type, and protective devices specified.

### How to wire

1. Connect the connecting cable to the terminal as identified with their respective matched numbers on the terminal block of indoor and outdoor unit. H07 RN-F or 245 IEC 66 (1.5 $mm^2$ or more)
2. Insulate the unsheathed redundant cords (conductors) with electrical insulation tape. Process them so that they do not touch any electrical or metal parts.
3. For inter-unit wiring, do not use a cut wire jointed to another on the way.

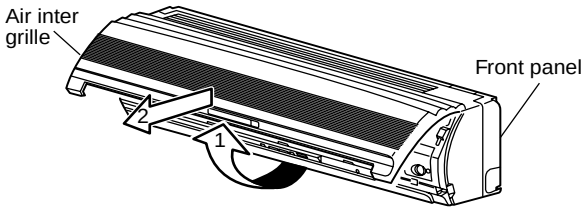


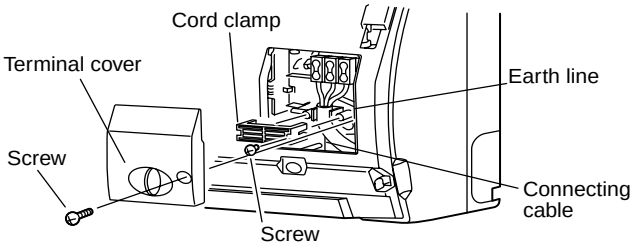




### Wiring between units

1. Connect the wires between the units correctly. Errors made in the connections can result in the unit malfunctioning.
2. Connect the control wires between the outdoor unit and indoor unit as shown in the figure below :

### Wiring connections



# 8 ELECTRICAL WORK

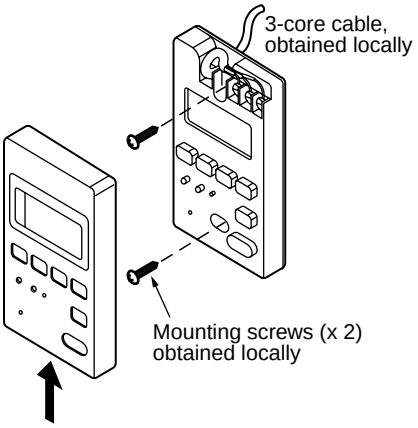
## Installation of Remote Controllers

### Precautions

1. Low-voltage circuit provision is used for remote controller communication, and as such, the remote controller cable is subject to the low-power circuit provision of internal wiring regulations and therefore it cannot be brought into direct contact with a high-voltage AC power line, or housed in the same conduit tube as a power line.

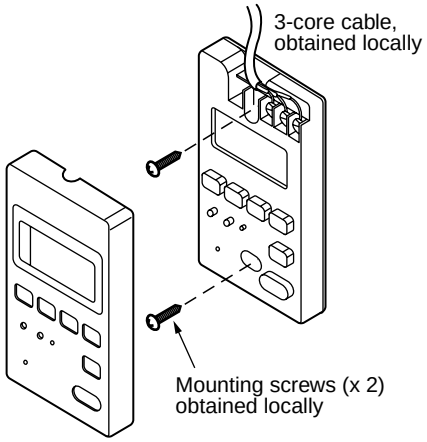
### Flush wall mounting

- Feed the 3-core cable (obtained locally) though the back of the remote controller and then connect to the ABC terminals.
- Attach the remote controller to the wall using two suitable mounting screws (obtained locally).



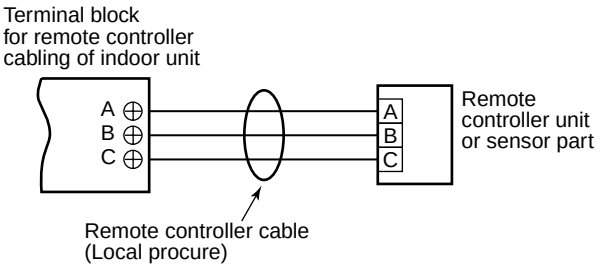

### Wall surface mounting

- Attach the remote controller to the wall using two suitable mounting screws (obtained locally).
- Connect the 3-core cable (obtained locally) to the ABC terminals.
- Make a U-shaped cut-out in the center of the top edge of the decorative cover and pass the 3-core cable though the cut-out.




## Remote Controller Cabling

### Cabling diagram




- For details of cabling/installation of the remote controller, refer to the Installation Manual packaged in the remote controller.

# 9 IMPROVING SYSTEM EFFICIENCY

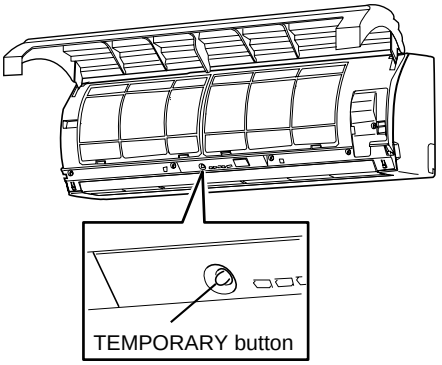
### Air flow direction adjustment

1. To improve the effects of cooling and heating, use the outlet louver appropriately for cooling and heating operations. When in cooling operation the most efficient louver position will be horizontal and when in heating operation the optimum louver position is downwards.

### Increasing heating effect

1. One method increase the warming effect is to fit an additional means of re-circulating the warmed air from the upper part of the room :
2. However if the warming effect of the air conditioner is not good owing to the installation position or the structure of the room, then reset the room temperature regulator as follows to raise the temperature of the room. Adjust position 1 and 2 on DIP switch SW03 located on the indoor P.C. board, according to the table below :

| | | | |
|---|---|---|---|
| **Dip switch SW03 position 1 & 2** | Position 1 : ON | Position 1 : OFF | Position 1 : OFF |
| | Position 2 : OFF | Position 2 : ON | Position 2 : OFF |
| **Temperature increased** | Factory pre-set | +2°C | +4°C |




### Options

### Test operation

To switch the TEST RUN (COOL) mode, push TEMPORARY button for 10 seconds. (The beeper will make a short beep.)

# 10 FINAL INSTALLATION CHECKS

### Precautions

1. Ensure that the electrical cable used for power supply and control of the system is unable to come into contact with either service valves or piping work which are not insulated.

### Electrical wiring

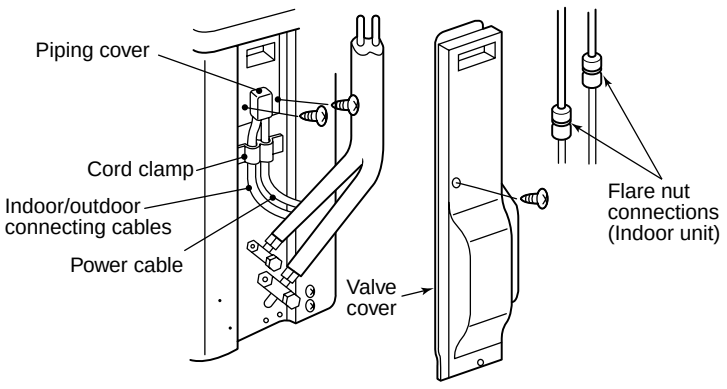
1. When installation is complete, check that all power supply and interconnecting wiring has been appropriately protected.

### Refrigerant piping

1. When refrigerant and drain piping have been completed. Ensure that all pipework is fully insulated and apply finishing tape to seal the insulation.

### Check and Test Operation

- Pressure of R410A is approx. 1.6 times of that of R22. If installation work is incompletely finished, a gas leakage may occur at the cases such as pressure rise during operation.
  Therefore, be sure to test the piping connections for leakage.
- Check the flare nut connections, valve stem cap connections and service port cap fittings for gas leak with a leak detector or soap water.



# 10 FINAL INSTALLATION CHECKS

## Useful Functions (SM800AT-E only)

### Self-Diagnosis by LED Indication

In addition to the code checking by remote controller of the indoor unit, troubles of the outdoor unit can be diagnosed by LED indications on the cycle control P.C. board of the outdoor unit. Utilize them for various checks.
For the check by remote controller of the indoor unit, refer to the Installation Manual of the indoor unit.
Before a check, confirm each bit of the DIP switch is set to OFF position.

**LED indication and code checking**

| LED indication | Cycle control P.C. board LED indication | | | | Cause |
|---|---|---|---|---|---|
| | D800 | D801 | D802 | D803 | |
| D800 ○ : Red<br>D801 ○ : Yellow<br>D802 ○ : Yellow<br>D803 ○ : Yellow<br><br>◎ : Rapid flash<br>● : Go off<br>○ : Go on | ○ | ● | ● | ● | Heat exchanger sensor (TE) error |
| | ● | ● | ○ | ● | Suction sensor (TS) error |
| | ○ | ○ | ● | ● | Discharge sensor (TD) error |
| | ● | ○ | ● | ○ | High-pressure protection error |
| | ● | ○ | ● | ● | Outdoor temperature sensor (TO) error |
| | ○ | ○ | ○ | ● | DC outside fan error |
| | ○ | ● | ● | ○ | Communication error between IPDU (Abnormal stop) |
| | ● | ○ | ● | ○ | High-pressure release operation |
| | ● | ○ | ○ | ● | Discharge temp. error |
| | ○ | ○ | ● | ○ | EEPROM error |
| | ● | ● | ○ | ○ | Communication error between IPDU (No abnormal stop) |
| | ◎ | ● | ● | ● | G-Tr short-circuit protection |
| | ● | ◎ | ● | ● | Detect circuit error |
| | ◎ | ◎ | ● | ● | Current sensor error |
| | ● | ● | ◎ | ● | Comp. lock error |
| | ◎ | ● | ◎ | ● | Comp. break down |

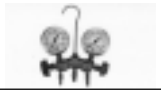
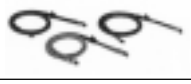
## Installation/Servicing Tools

### Changes in the product and components

In the case of an air conditioner using R410A, in order to prevent any other refrigerant from being charged accidentally, service port diameter of the outdoor unit control valve (3 way valve) has been changed. (1/2 UNF 20 threads per inch)

- In order to increase the pressure resisting strength of the refrigerant piping flare processing diameter and size of opposite side of flare nuts has been changed. (for copper pipes with nominal dimensions 1/2 and 5/8)

**New tools for R410A**

| New tools for R410A | Applicable to R22 model | | Changes |
|---|---|---|---|
| Gauge manifold | ✕ |  | As pressure is high, it is impossible to measure by means of conventional gauge. In order to prevent any other refrigerant from being charged, each port diameter is changed. |
| Charge hose | ✕ |  | In order to increase pressure resisting strength, hose materials and port size are changed (to 1/2 UNF 20 threads per inch).<br>When purchasing a charge hose, be sure to check the port size. |
| Electronic balance for refrigerant charging | ○ | | As pressure is high and gasification speed is fast, it is difficult to read the indicated value by means of charging cylinder, as air bubbles occur. |
| Torque wrench (nominal diam. 1/2, 5/8) | ✕ | | The size of opposite sides of flare nuts have been increased. Incidentally, a common wrench is used for nominal diameters 1/4 and 3/8. |
| Flare tool (clutch type) | ○ | | By increasing the clamp bar's receiving hole, strength of spring in the tool has been improved. |
| Gauge for projection adjustment | — | — | Used when flare is made with using conventional flare tool. |
| Vacuum pump adapter | ○ | | Connected to the conventional vacuum pump. It is necessary to use an adapter to prevent vacuum pump oil from flowing back to the charge hose. The charge hose connecting part has two ports-one for conventional refrigerant (7/16 UNF 20 threads per inch) and one for R410A.<br>If the vacuum pump oil (mineral) mixes with R410A a sludge may occur and damage the equipment. |
| Gas leakage detector | ✕ | | Exclusive for HFC refrigerant. |

- Incidentally, the "refrigerant cylinder" comes with the refrigerant designation (R410A) and protector coating in the U,S.'s ARI specified rose color (ARI color code: PMS 507).
- Also, the "charge port and packing for refrigerant cylinder" require 1/2 UNF 20 threads per inch corresponding to the charge hose's port size.

# 11 ENVIRONMENT

## Environmental Issues

### Product maintenance

1. To minimize the chances of environmental damage and to ensure the efficient operation of the unit, it is recommended to have the air conditioner periodically checked and serviced by a qualified engineer.

### Product disposal

1. Please dispose of the air conditioner unit in an environmentally responsible manner.
   Recycling is the preferred disposal method.
2. When disposing of an air conditioner system, contact either the manufacture, your local environmental control authority or a local waste disposal company for advice.
3. Ensure all packing material is either recycled or disposed of in accordance with local regulations.
4. The refrigerant gas within the unit should only be removed by an authorized company.

**WARNING**

**Discharge of refrigerant to atmosphere is illegal and may lead to prosecution.**

# ACCESSORIES

## CONTENTS

# OWNER'S MANUAL


**REMOTE CONTROLLER FOR AIR CONDITIONER (SPLIT TYPE)**

**<Wireless Type>**
**TCB-AX21U (W)-E ..... 107**

**WEEKLY TIMER FOR AIR CONDITIONER (SPLIT TYPE)**

**<Program Weekly Timer Type>**
**RBC-EXW21E ..... 115**

**REMOTE CONTROLLER FOR AIR CONDITIONER**

**<Simple Operation Type>**
**RBC-AS21E ..... 121**


# INSTALLATION MANUAL


**Ceiling Panel**
**RBC-U21PG (W)-E ..... 124**

**Standard Remote Controller**
**RBC-AMT21E ..... 126**

**Simple Remote Controller**
**RBC-AS21E ..... 127**

**Program Weekly Timer**
**RBC-EXW21E ..... 128**

**Remote sensor**
**TCB-TC21LE ..... 129**

**Drain-up Kit for Concealed Duct Type Indoor Unit**
**TCB-DP11BE ..... 130**

**Remote Controller Wireless Kit**
**TCB-AX21U (W)-E ..... 131**

# OWNER'S MANUAL

## REMOTE CONTROLLER FOR AIR CONDITIONER (SPLIT TYPE)

**<Wireless Type>**

# TCB-AX21U (W)-E

Thank you very much for purchasing TOSHIBA Remote Controller for Air Conditioner.
Please read this owner's manual carefully before using your Remote Controller for Air Conditioner.

- Be sure to obtain the "Owner's manual" and "Installation manual" from constructor (or dealer).

Request to constructor or dealer
Please clearly explain the contents of the Owner's manual and hand over it.

## CONTENTS


PRECAUTIONS FOR SAFETY ..... 108
NAME AND OPERATION ..... 108
HOW TO SET THE FAN SPEED ..... 109
HOW TO OPERATE THE UNIT ..... 111
HOW TO OPERATE THE TIMER ..... 111
HOW TO ADJUST AIR DIRECTION ..... 112
SLIDE SWITCH ..... 112
HOW TO INSERT THE BATTERIES ..... 112
HOW TO HANDLE THE REMOTE CONTROLLER ..... 113
HOW TO USE THE REMOTE CONTROLLER CORRECTLY ..... 113
ADDRESS ..... 113
HOW TO PERFORM EMERGENCY OPERATION ..... 114
BEFORE ASKING REPAIR WORK ..... 114

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## PRECAUTIONS FOR SAFETY

**WARNING ⚠**

### WARNINGS ABOUT INSTALLATION

- Make sure to ask the qualified installation professional in electric work to install the remote controller. If the remote controller is inappropriate installed by yourself, it may cause, electric shock, fire, and so on.

### WARNINGS ABOUT OPERATION

- When you are aware of something abnormal with the air conditioner (smells like something etc.), immediately turn off the main power supply switch or circuit breaker, from the mains to stop the air conditioner, and make contact with the dealer. If the air conditioner is continuously operated with something abnormal, it may cause machine failure, electric shock, fire, and so on.

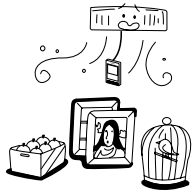
### WARNINGS ABOUT MOVEMENT AND REPAIR

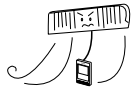
- Do not repair any unit by yourself.
- Whenever the air conditioner needs repair, make sure to ask the dealer to do it. If it is repaired imperfectly, it may cause electric shock or fire.

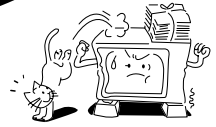
**CAUTION**

### CAUTIONS ABOUT OPERATION

- Carefully read this manual before starting the air conditioner. There are many important things for the safety and the correct usage.
- Do not touch any switches with wet finger, otherwise you may get an electric shock.
- When the air conditioner was not be used for a considerably long time, turn off the main switch or the circuit breaker, for safety. Disconnect from the power supply prevents the unit from lightning and power supply surge.
- Prevent any liquid from falling into the remote controller. Do not spill juice, water or any kind of liquid.



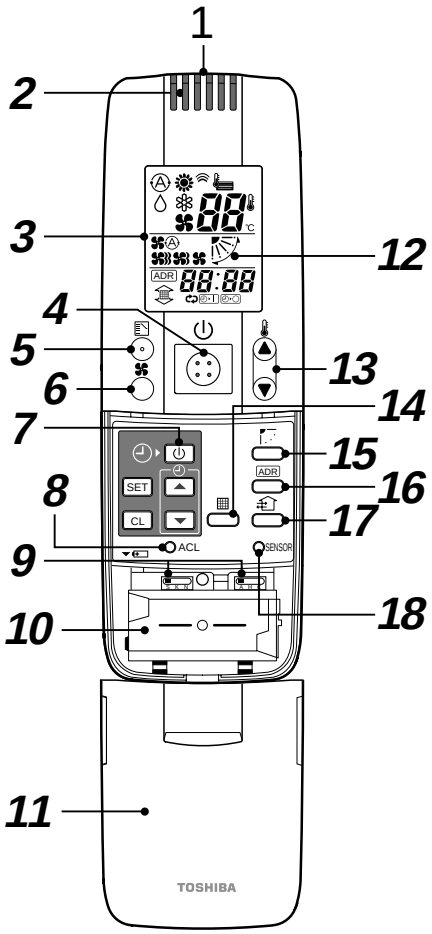




## NAME AND OPERATION

**Remote Controller**

- Max. 8 indoor units can be operated by a remote controller as a group.




***1*** **Transmitting part**

***2*** **Remote controller sensor**
The peripheral temperature is sensed when the sensor button is pushed to remote controller side.

***3*** **Mode display section**
The operation mode is displayed.

***4*** **Start/Stop button**
Pushing this button starts, and pushing again stops the unit.

***5*** **Mode Select button**
Pushing this button selects an operation mode.

***6*** **Air volume button**

***7*** Time Setup button
This button is used when the timer is setup.

***8*** **Reset button**
This button is used after replacement of battery or selection of slide switch.

***9*** **Slide switch**

***10*** **Part storing batteries**

***11*** **Cover**
Slide the cover holding its both sides.

***12*** **AUTO flap display differs according to the installed unit.**

***13*** **Setup Temp. button**
Every pushing this button, temperature rises by 1˚C.
Every pushing this button, temperature lowers by 1˚C.

***14*** **Filter button**
The remote controller is not operated even if this switch is pushed.

***15*** **Swing/Air direction button**

***16*** **Address button**

***17*** **Ventilation button**
The remote controller is not operated even if this switch is pushed.

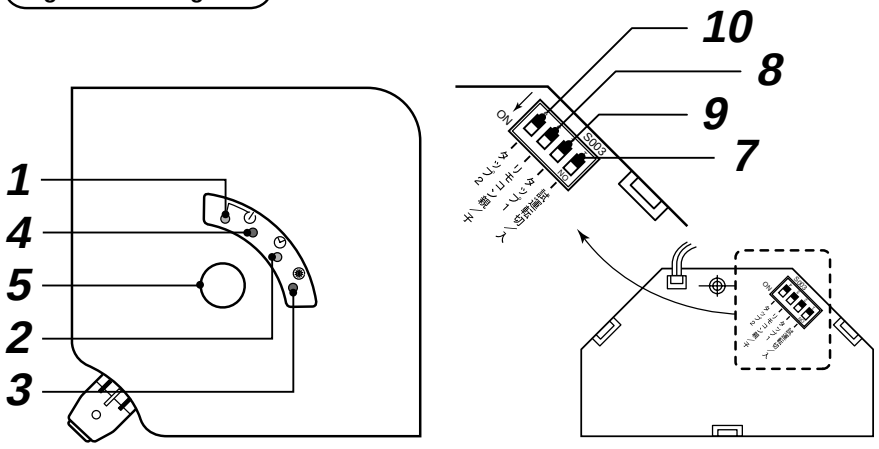
***18*** **Sensor button**
This button is used when selecting the temp. sensor at the remote controller side. At the shipment from the factory, this button is set to the temp. sensor at the indoor unit.

## ACCESSORIES

# ACCESSORIES

- The signal receiving part is mounted to the ceiling panel.

**Signal Receiving Part**




**1** **Emergency operation button**

**2** **Signal receiving part**
The signal sent from the remote controller is received.

**3** **Display lamp**
One of displays flashed while a trouble occurs. When the display lamp flashes, refer to “Before asking of repair”.

**4** ⏻ **lamp**
This lamp goes on during operation.

**5** ◴ **lamp**
This lamp goes on while the timer is reserved.

**6** ✺ **lamp**
- In heating operation this lamp in the following cases;
  The operation has started.
  The temp. controller has worked.
  The unit is under defrost operation.
- This lamp flashes while a trouble occurs.

**7** 試運転 入 **(S003-1) Trial ON switch**
This switch is not used in normal time, but used in trial operation time.

**8** リモコン親 / リモコン子 **(S003-3) Priority/Secondary switch**
Use this switch at the position of [ リモコン親 (PRIORITY)] . This switch can be used together with the wired remote controller.

**9** **Fan speed change tap 1 (S003-2)**

**10** **Fan speed change tap 2 (S003-4)**
These switches are used to select DC motor speed of a 4-way cassette type indoor unit by the taps.
When installing an indoor unit to a high ceiling surface or when changing the number of discharge ports, perform setting referring to the next page.

**11** **Address switch**
This switch distinguishes the signal, send or receive.

The following switches are provided to the rear side of the receiving part. For setup, contact the shop which you purchased the unit.

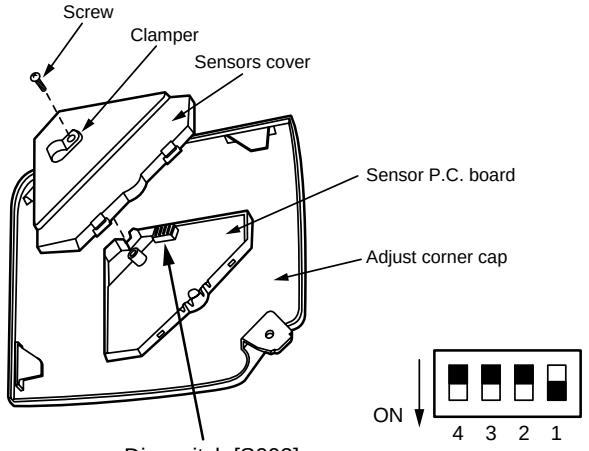
- If “pi, pi” sound is heard, the MODE lamp of the display lamp goes on, and the ◴ lamp and ✺ lamp flash alternately, the operation is not performed with the desired mode.

# HOW TO SET THE FAN SPEED

When installing a 4-way cassette type indoor unit to high ceiling of a room, the fan motor speed can be selected in agreement with height of the ceiling and numbers of the discharge port.
For details, refer to the Installation Manual for 4-way discharge cassette type unit.

| Setup No. | Tap 1 | Tap 2 | Installable ceiling height (Unit: m) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | RAV-SM560UT-E | | | RAV-SM800UT-E | | | RAV-SM1120UT-E RAV-SM1400UT-E | | |
| | | | 4-ways | 3-ways | 2-ways | 4-ways | 3-ways | 2-ways | 4-ways | 3-ways | 2-ways |
| (0) | OFF<br>Setting at shipment | OFF | 2.8 | 3.2 | 3.5 | 3.0 | 3.3 | 3.6 | 3.6 | 3.9 | 4.2 |
| (1) | OFF | ON | 3.2 | 3.5 | 3.8 | 3.3 | 3.5 | 3.8 | 3.9 | 4.1 | 4.3 |
| (3) | ON | OFF | 3.5 | 3.8 | — | 3.6 | 3.8 | — | 4.2 | 4.3 | — |

The fan motor speed is selected by Dip switch [S003] on the sensor P.C. board inside or the adjust corner cap (including sensors) of the ceiling panel of 4-way discharge cassette type indoor unit.




Dip switch [S003]

| | |
|---|---|
| 1 | Used in [Trial operation] |
| 2 | Tap 1 ← |
| 3 | Used by selecting [Priority/Secondary] |
| 4 | Tap 2 ← |

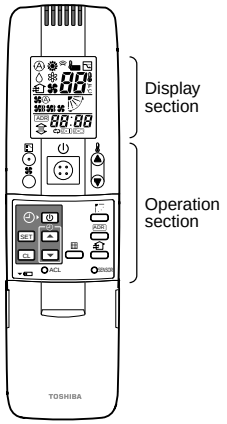
- After selecting a fan motor speed, reassemble the ceiling panel as before.
  Using a clamper, fix the cable connectors with screws.

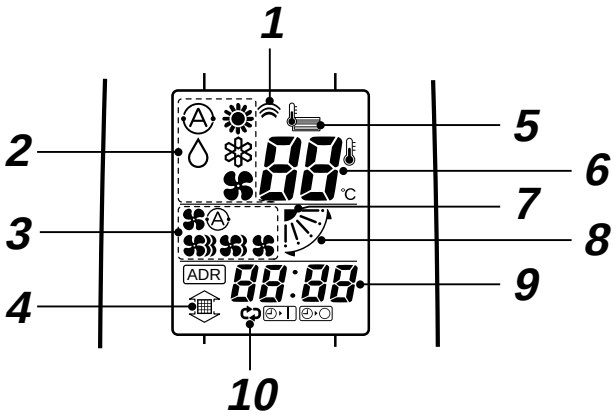
## Display Section

All indicators are shown in the right and the lower figures for the explanation.

Only selected contents are display in actual operation.

- When turning on the leakage breaker at the first time 3 minutes later, **[SET DATA]** flashes about for 1 minute on the display part of the remote controller. While this display is flashing, the model is being automatically confirmed. Accordingly, wait for 1 minute after **[SET DATA]** display has disappeared, and then use the remote controller.




**1** **Transmitting indication**
Displayed while operating the switches of the remote controller.

**2** **Mode display**
The selected operation mode is displayed.

**3** **Fan mode select display**
The selected fan mode is displayed.
(AUTO)
(HIGH)
(MED.)
(LOW)

**4** **Filter display**
If "FILTER" is displayed, clean the air filter.

**5** **CHECK display**
Displayed while the protective device works or a trouble occurs.

**6** **Set up temperature display**
The selected set up temp. is displayed.

**7** **Flap position display**

**8** **SWING display**
Displayed during up/down movement of the flap.

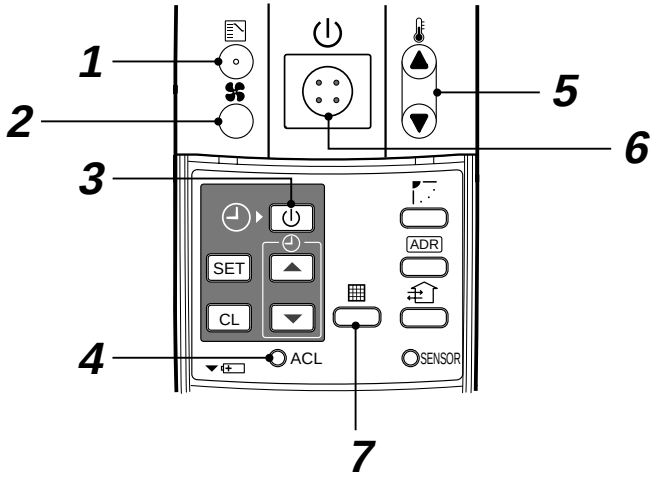
**9** **Timer time display**
Time of the timer is displayed.
(When a trouble occurs, the check code is displayed.)

**10** **Timer SETIN setup display**
When pushing the Timer SET button, the display of the timer is selected in order of [OFF] ® [OFF] repeat OFF timer ® [ON] ® No display.

## Operation Section

Push each button to select a desired operation.

- The details of the operation needs to be set up once, afterward, the air conditioner can be used by pushing (⏻) button only.




**1** **Operation select button**
Selects desired operation mode.

**2** **Fan mode select button**
Selects a fan mode.

**3** **Timer set button**
TIMER SET button is used when the timer is set up.

**4** **Check button**
CHECK button is used for check operation. During normal operation, do not use this button.

**5** **Temperature set button**
Adjusts required room temperature.
Set required set temperature by pushing (▲) or (▼) .

**6** **Start/Stop button**
When the button is pushed, operation starts, and it stops by pushing the button again.
When the operation stops, the operation lamp and all displays disappear.

**7** **Filter reset button**
Resets (Erases) "FILTER" display.

**OPTION :**

**Remote controller sensor**

Usually the TEMP. sensor of the indoor unit measured a temperature. A temperature around the remote controller can also be measured.

For details, contact the dealer from which you have purchased the air conditioner.



# ACCESSORIES

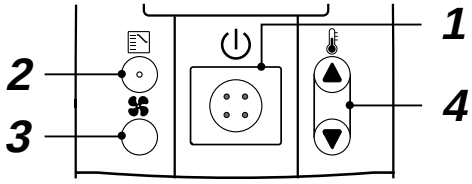
## HOW TO OPERATE THE UNIT

**Cool/Heat AUTO, Heat, Dry, Cool, Fan**

**Power supply**

Turn on the power of the wireless remote controller 12 hours before starting the operation.

- After the power supply has been turned on, the operation of the remote controller is not accepted for approx. 1 minute. It is not a failure.
  (The sensor receives the signal once, but the received contents are cleared.)




***1*** **Push Start/Stop button.**

***2*** **Push (Operation Select button) operation to select one of Ⓐ, ☀, 💧, ❄, and 🌀.**

***3*** **Push 🌀 (Fan Mode Select button) to select one of fan speed modes.**
When selecting Ⓐ, the fan speed is automatically changed.
(During FAN mode, the air speed is not automatically changed.)

***4*** **Push either ▲ or ▼ to select the desired temperature.**
- During FAN mode, the temperature cannot be set up.

***5*** **Stop**
Push Start/Stop button.
When using the remote controller to stop the unit, the outdoor unit fan may keep operating for a while even if the compressor of the outdoor unit has stopped.

- In heating operation, if the room is not comfortably heated with FAN 🌀, select FAN 🌀 or 🌀.
  Although they are displayed, the function may not be provided according to the used indoor unit. (Fan speed is constant.)
- When the unit cannot be stopped by the normal operation
  Turn off the power switch or leakage breaker, and then contact the shop which you purchased the unit.

**Automatic cool/heat**

When all indoor units in the identical refrigerant system are controlled as a group, the cooling/heating operation is automatically performed with the difference between the setup temperature and the room temperature.

**Dry operation**

- There is no dry function according to the used indoor unit even if DRY is displayed on the display section of the remote controller. (Same to Cooling operation)
- When the room temperature approaches the setup temperature, running/stop operations are automatically repeated.
- In order not to return humidity to the room as possible, the mode of indoor fan enters LOW mode when the operation has stopped.
- The fan speed cannot be adjusted according to the used indoor unit or status of the room temperature.
- The DRY mode cannot be used according to the used indoor unit when the outdoor temperature is 15˚C or lower.

## HOW TO OPERATE THE TIMER

- After setting of the timer, set the remote controller at a position where the signal can reach the sensors (indoor unit body) .
  (The signal of the timer operation is sent from the remote controller.)
- Set up the timer during display of the operation mode.

| Use in the following cases | During display |
|---|---|
| To stop the air conditioner after the previously set time has passed | ⏲▸\| |
| To stop the air conditioner every time after the previously set time has passed | ↻ ⏲▸\| |
| To operate the air conditioner after the previously set time has passed | ⏲▸◯ |

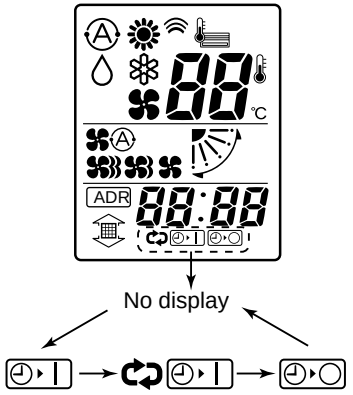
**Timer time**

Every pushing ▲, the setup time increases by 0.5 hour (30 minutes).
The maximum time to be set is 72.0 hours.

Every pushing ▼, the setup time decreases by 0.5 hour (30 minutes).
The minimum time to be set is 0.5 hours.

**Timer display**

Every pushing SET, the display changes as follows;




**<Use example>**

**How to use OFF timer**

**(Ex.)** To stop the unit 30 minutes after

**1 When pushing the timer SET once, ⏲▸\| and the time flash on the remote controller.**

**2 Push TIME ▲ or ▼ to set the time to 0.5.**

**3 Push SET and the ⏲▸\| go on timer.**

**How to use the repeat timer**

**(Ex.)** To stop the air conditioner every time after 2.5 hours has passed

**1 When pushing the timer SET twice, ↻, ⏲▸\| and the time flash on the remote controller.**

**2 Push TIME ▲ or ▼ to set the time to 2.5.**

**3 Push SET and the ↻, ⏲▸\| go on timer.**
The ⏲▸\| works, and the operation stops after 2.5 hours. When pushing ⏻ (Start/Stop) button again to operate the unit, the operation stops after 2.5 hours.

**How to use ON timer**

**(Ex.)** To operate the unit 8 hours after

**1 When pushing the timer SET three times, ⏲▸\| and the timer flash on the remote controller.**

**2 Push TIME ▲ or ▼ to set the time to 8.0.**

**3 Push SET**
The operation mode display disappears, and then time and the ⏲▸\| go on.

**To stop the timer operation**

To stop the timer operation
Push CL button. Then the timer display disappears.

## HOW TO ADJUST AIR DIRECTION

- Never move the flap (Air direction up/down adjusting plate) which is operated on the remote controller with hands except a case of cleaning of the flap.
- While the unit stops, the flap (Air direction up/down adjusting plate) directs downward automatically.
- During preparation of heating, the flap (Air direction up/down adjusting plate) directs upward. The swinging operation starts after heating preparation status has been cleared. However, swinging is displayed on the AUTO flap display of the remote controller even if the heating operation is being prepared.

**How to set up the air direction**

Every pushing button during operation, the air direction changes.

**How to start swinging**

When pushing button, set the direction of the flap (Air direction up/down adjusting plate) to the lowest position, and then push button again, the swinging is displayed and the air direction automatically changes upward/downward.

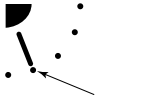
**How to stop swinging**

Pushing button once again during swinging of the flap stops the flap at the desired position. Then, when pushing button, the air direction can be set to position from the uppermost position.

- In cooling or dry operation, the flap does not stop when the flap directs downward.
  If doing so, the flap stops at the 3rd position from the uppermost position.

**In heating operation**

Direct the flap (Air direction up/down adjusting plate) downward, otherwise the hot air may not reach at the foot.




**In cooling/dry operation**

Direct the flap (Air direction up/down adjusting plate) upward, otherwise dewdrops may adhere or drip down to near of the discharge grille.

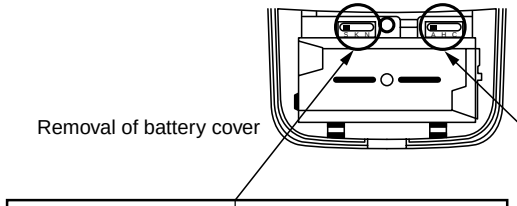
**In air blowing operation**

**In all operation modes**

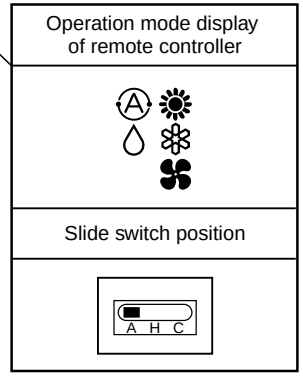
**Display when swinging stopped**

## SLIDE SWITCH

- Do not change setting of the slide switch because a malfunction occurs by other settings.
- Before usage, check the slide switch is set to the position as follows;



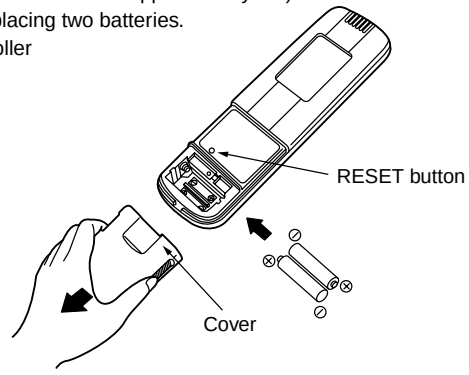

| | Corresponding model for change of flap |
|---|---|
| Slide switch position | S K N |
| Flashing position on remote controller | HIGH / MED. Swing |




## HOW TO INSERT THE BATTERIES

1. Holding the both sides of the cover and remove it by sliding downward.
2. Correctly insert 2 AAA alkali batteries matching + and - polarities with indications.
3. Push RESET button with something tipped and attach the cover.

- Replace the batteries when the display section of the remote controller is difficult to be read, or when the signal cannot be sent if you are not close to the sensor.
  (The standard replacement time of the alkali batteries is approx. one year.)
- Use the same type of new batteries for replacing two batteries.
- In case when you do not the remote controller for a long time, remove the batteries.

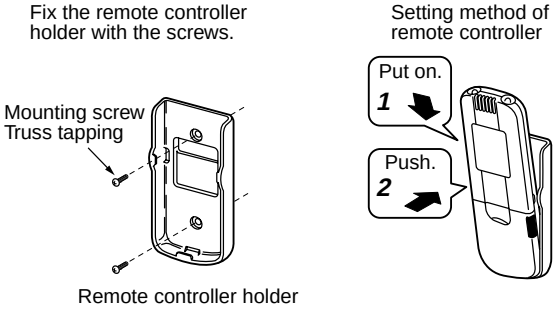


## HOW TO HANDLE THE REMOTE CONTROLLER

- Direct the transmitter of the remote controller toward the sensor (indoor unit body).
  When the signal is normally received, “Pi” sound is heard once.
  (“Pi, pi” sounds are heard only when the operation has started.)
- The standard distance which the signal can be received is approx. 7m.
  The distance differs a little according to the capacity of the battery, etc.
- Be careful there is not something to block the signal between the sensor (indoor unit body) and the remote controller.
- Do not put the remote controller on the place exposed to the direct sunlight or air from the air conditioner or near the stove, etc.
- Do not drop, throw, or clean with water the remote controller.
- The signal may be accepted in a room where the electronic instantaneous-ON type or inverter type florescent light is set. For details, contact the shop which you purchased the air conditioner.

### To Use the Remote Controller Setting to Wall, etc.

- Check a signal is received correctly by pushing (⏻) Start/Stop button at the position to be fixed.
- To take off remote controller, pull it toward you.




## HOW TO USE THE REMOTE CONTROLLER CORRECTLY

- **Set the remote controller so that it is not excessively far from the sensor (indoor unit), otherwise a malfunction is caused.**
  Be sure to set the remote controller in the same room where the sensor (indoor unit) is installed.
- **Direct the remote controller toward the sensor (indoor unit) for operation.**
  When a signal is correctly received, “Pi” sound can be heard.
- **Avoid to set the remote controller at a place where it is covered with curtain, etc.**

## ADDRESS

**When the multiple indoor units corresponding to the wireless remote controller are installed in the same room, an address can be set up to prevent an interference.**

**Matching the address switch of the sensor with number of the remote controller address, Max. 6 indoor units can be controlled by the corresponding remote controller individually.**

**The address switch for receiving the signal is prepared to the sensor (inside of panel or indoor unit) and the address switch for sending the signal is prepared to the remote controller. For details, contact the shop which you purchased the air conditioner.**

### How to Check the Address

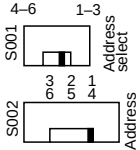
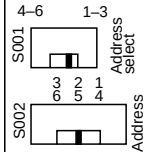
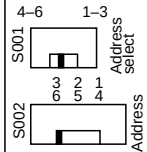
When pushing [ADR] button on the remote controller, the present address is displayed on the display section of the remote controller. If this address matches with the address of the sensor (inside of panel or indoor unit), a buzzer sounds.
(When ALL is displayed, buzzer sound is necessarily heard.)

When ALL is displayed, the air conditioner can be operated regardless of any address of the sensor (inside of the indoor unit). Send the signal by directing the remote controller toward the sensor (panel or indoor unit body) to be handled.

### How to Match the Address

Setup to remote controller address

1. When keeping [ADR] pushed for 4 seconds or more, [ADR] lamp goes on at the display section of the remote controller and the present address is displayed with flashing.
2. Every pushing [ADR], the address is exchanged as ALL → 1 → 2 → 3 … → 6 → ALL. Match one of them with the address switch of the indoor unit sensor to be handled.
3. When pushing [CL], the address display goes on and is displayed for 5 seconds.
   If the address matches with the address switch of the operation part, the buzzer sounds.

| Display of remote controller address | Address<br>ALL | Address<br>1 | Address<br>2 | ..... | Address<br>6 |
|---|---|---|---|---|---|
| Address switch position of sensor | * Address switch of sensor unit can be set any position. |  |  | ..... |  |

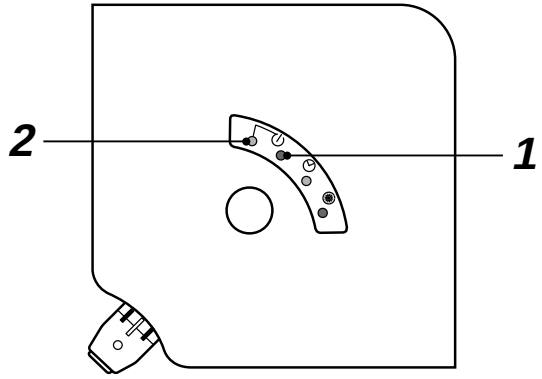


Turn the knob to the right side for 1 to 3 while to the left side for 4 to 6 of Address select switch S001.

## HOW TO PERFORM EMERGENCY OPERATION

**In the following cases, operate the air conditioner in emergency by emergency operation of the operation part (inside of panel or indoor unit).**

- The battery in the remote controller expired.
- A trouble occurred on the remote controller.
- The remote controller have disappeared.




***1*** **Start**
Push emergency operation.
(If starting the operation when the room temperature is 24˚C or higher, the mode enters COOL mode. If starting the operation when the room temperature is 24˚C or lower, the mode enters HEAT mode.)

***2*** **Stop**
Push emergency operation once more.

**CAUTION**

- The ON switch of the test run and the ON switch of the test are used for the test run mode in the installation time. Do not use them in the normal time.
- If the “all stop” is selected in the normal/all stop switches, a signal from the remote controller is not accepted.

## BEFORE ASKING REPAIR WORK

**Before asking a repair work, check the following items.**

| Phenomenon | | Cause | Measures |
|---|---|---|---|
| Check again | Operation does not start even if the switch is turned on. | Stopped? or after power failure? | Push Start/Stop of the remote controller. |
| | | Is the power supply of the power switch? | Turn on the power supply switch if not. |
| | | Fuse? | Contact the shop which you purchased the air conditioner. |
| | | Is not the mode ON timer? | Delete the timer operation. |
| | | Is not [ALL OFF] of [Signal Receiving Part] selected? | Set the switch to [Normal position], and stop the operation. |
| | | Is not the battery of the remote controller expired? | Replace the battery. |
| | | Is not the state of the display lamp “Disagreement of ❄ (cool) and ✹ (heat)” or “No Ⓐ”? | Change the operation mode. |

| Phenomenon | | Cause |
|---|---|---|
| Contact the shop which you purchased the air conditioner | <Display lamp flashes.> | • It is a communication error between the sensor and the indoor unit, or setup error of the address when the wired remote controller is used. |
| | | • A communication error between the indoor unit and the outdoor unit. |
| | | • A protective device of the indoor unit works. |
| | | • A protective device of the outdoor unit works. |
| | | • A trouble occurred on the temperature sensor. |
| | | • The compressor of the outdoor unit is protected. |
| | | • The test run is performed. Turn off the Trial ON switch. |

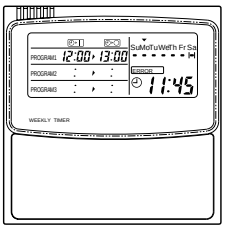
Please check the above items. If the trouble yet remains, stop the operation, turn off the power switch, and then notify the shop which you purchased the air conditioner of the part No. and phenomenon. Never repair any part by yourself because it is very dangerous. If the display lamp is flashing, also tell of its contents.

# OWNER'S MANUAL

## WEEKLY TIMER FOR AIR CONDITIONER (SPLIT TYPE)

**<Program Weekly Timer Type>**

# RBC-EXW21E



Thank you very much for purchasing TOSHIBA Weekly Timer for Air Conditioner.

Please read this owner's manual carefully before using your Weekly Timer for Air Conditioner.

- Be sure to obtain the "Owner's manual" and "Installation manual" from constructor (or dealer).

Request to constructor or dealer

Please clearly explain the contents of the Owner's manual and hand over it.

## FEATURES

1. Using the dialogue system, Start/Stop operations three times per one day can easily set with unit of 1 minute. The program for a week is also set up.
2. To set the holidays (public holidays, consecutive holidays, etc.), the operation reserve can temporarily cancelled.
3. The present time, the day of the week and the operation contents under execution of the program are displayed with 24-hours notation.
4. The output can be forcibly turned on without changing the program.
5. As the backup function is incorporated in this model, the reserve contents of the program are stored in memory during a power failure.

## CONTENTS


**PRECAUTIONS FOR SAFETY ..... 116**

**NAME AND OPERATION OF EACH PART ..... 116**

**HOW TO USE THE TIMER CORRECTLY ..... 117**

1. **Operation procedure ..... 117**
2. **Turn on the power supply of the air conditioner ..... 117**
3. **Setup of the present time ..... 117**
4. **Setup of the day of the week ..... 117**
5. **How to set program timer operation ..... 117**
6. **Set error ..... 118**
7. **How to copy the program operation time ..... 119**
8. **How to check the program operation time ..... 119**
9. **How to change the program operation time ..... 119**
10. **How to clear the program operation ..... 119**
11. **How to set up the holiday ..... 119**
12. **Matters to be memorized ..... 120**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## PRECAUTIONS FOR SAFETY

### WARNING ⚠

#### WARNINGS ABOUT INSTALLATION

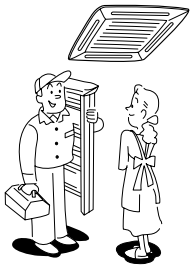
- Make sure to ask the qualified installation professional in electric work to install the weekly timer for air conditioner.
  If the weekly timer for air conditioner is inappropriate installed by yourself, it may cause water leak, electric shock, fire, and so on.

#### WARNINGS ABOUT OPERATION

- When you notice something abnormal with the air conditioner (smells like something scorching, poor cooling, etc.), immediately turn off the main switch, the circuit breaker, from the mains to stop the air conditioner, and contact the dealer.
  If the air conditioner is continuously operated with something abnormal, it may cause machine failure, electric shock, fire, and so on.

#### WARNINGS ABOUT MOVEMENT AND REPAIR

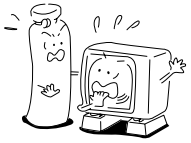
- Do not move or repair any unit by yourself.
  Since there is high voltage inside the unit, you may get electric shock when removing the cover and main unit.
- Whenever the air conditioner needs repair, make sure to ask the dealer to do it.
  If it is repaired imperfectly, it may cause electric shock or fire.
- When moving the air conditioner for re-installing at another place, ask the dealer to do it.
  If it is imperfectly installed, it may cause electric shock or fire.

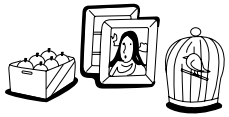


### CAUTION

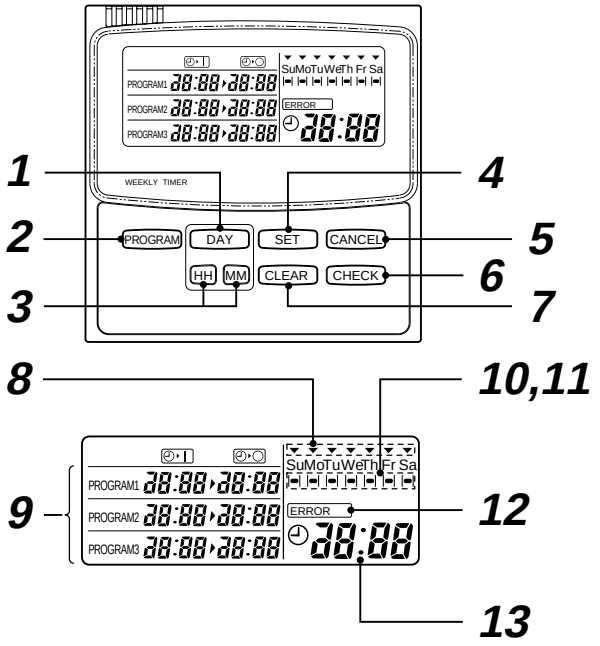
#### CAUTIONS ABOUT OPERATION

- Carefully read this manual before starting the weekly timer for air conditioner.
  There are many important things to keep in mind for daily operation.
- Do not use this weekly timer for air conditioner for special purpose such as preserving food, precision instruments, art objects, breeding animals, growing potted plants, etc.
- Do not touch any switches with wet finger, otherwise you may get an electric shock.
- If the air conditioner was not be used for a considerably long time, turn off the main switch or the circuit breaker, for safety. Disconnect from the power supply prevents the unit from lightning and power supply surge.
- Prevent any liquid from falling into the weekly timer.
  Do not spill juice, water or any kind of liquid.





## NAME AND OPERATION OF EACH PART




**1 Day select button**
The day of the week is selected.
Each pushing, ▼ mark moves in order of Sunday → Monday → Tuesday → Wednesday → Thursday → Friday → Saturday.

**2 Program button**
This button is used to set up the contents of the program operation.

**3 Hour/Minute button**
This button is used to set the present time and ON/OFF time.

**4 Timer set button**
This button is used to set the day of the week, hour, minute, holiday, and ON/OFF time.

**5 Cancel button**
This button is used to cancel as the holiday.

**6 Check button**
This button is used to confirm the contents of the setting items.

**7 Cancel button**
This button is used to cancel the setting items.

**8 Display of the present day of the week (▼ mark)**

**9 ON/OFF time display**
ON/OFF time of the timer operation is displays.

**10 Operation reserve indication (▬ mark)**
The day of the week when the program operation has been set is displayed.

**11 Holiday setting indication (|➡| mark)**
The holiday is displayed
(Cancel as holiday)

**12 Setting error display**

**13 Present time display**
Displays the present time displayed with 24-hours notation.

# HOW TO USE THE TIMER CORRECTLY

## 1. Operation procedure

**Power ON**

Turn on the power of the air conditioner.

⇨

**Program weekly timer set up**

Setup of the present time

Setup of the present day of the week

Setup of the program operation for a week

## 2. Turn on the power supply of the air conditioner

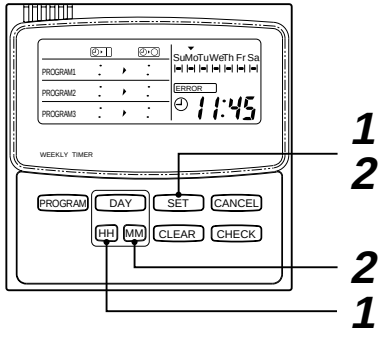
- **Turn on the power supply of the air conditioner connected with a program weekly timer. (For cooling and heating, do not turn off the power supply for compressor heating.)**

## 3. Setup of the present time

- **Set the present time**
  **(Example: Case that the present time is 11:45.)**

***1*** **While push (SET) button push (HH) button to select "hour" of the present time.**

- While push (SET) button each pushing (HH) button, change sequently.
  0 → 1 → ••• → 10 → ••• → 23 → 0
- While keep (SET) button pushed, continuous pushing (HH) button makes fast forward. (Example: Leave the finger at display of 11, you can set 11 o'clock.)
- When release (SET) button, the hour is set, and (🕘) mark changes flashing to light.




***2*** **While push (SET) button push (MM) button to select "minutes" of the present time.**

- While push (SET) button, each pushing (MM) button change sequently.
  00 → 01 → ••• → 58 → 59 → 60
- While keep (SET) button pushed continuous, pushing (MM) button makes fast forward. (Example: Leave the finger at display of 45 you can set 45 minutes.)
- When release (SET) button, the minutes are set, and (🕘) make changes flashing to light.

**CAUTION**

- The time cannot be changed only when (HH) button or (MM) button pushed.
- If 30 seconds have passed while the button is flashing without pushing (DAY) or (HH) / (MM) buttons, the display returns automatically to the original display (Normal display). In this case, repeat the procedure from the 1st step.

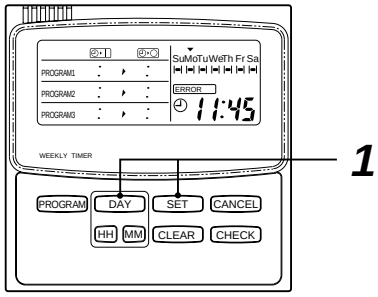
## 4. Setup of the day of the week

- **Set the today of the week.**
  **(Example: Case of Wednesday)**

***1*** **While push (SET) button push (DAY) button to select "today" of the week.**

- While pushing (SET) button, each push (DAY) button, the display of the present day of the week ▼ flashes, and the display moves in order.

▽ ▽ ▽ ▼ ▽ ▽ ▽
SuMoTuWeTh Fr Sa




**CAUTION**

- The day of the week cannot be changed only when (DAY) button is pushed.
- If 30 seconds have passed while the button is flashing without pushing (DAY) or (HH) / (MM) buttons, the display returns automatically to the original display (Normal display). In this case, repeat the procedure from the 1st step.

## 5. How to set program timer operation

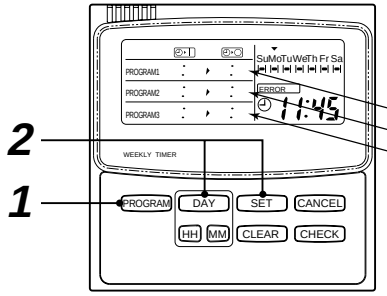
**Set the present time and the present day of the week surely, otherwise the program operation is not correctly performed.**

This timer can control up to 3 cycle program per day.
(1 cycle or 2 cycles can be also set up.)

The following items can be set to the program operation.

- Setup of [ON] ® [OFF] time ([ON] or [OFF] only cannot be set up singly.

**<Name and functions>**




Operation time of program 1
Operation time of program 2
Operation time of program 3

Example:
To set the operation time of Monday as follows:
From 8:00 to 12:00
From 12:40 to 16:50 } Operates
From 17:00 to 19:00

***1*** **First push (PROGRAM) button.**

- When pushing (PROGRAM) button, the reserve mark ▬ flashes.

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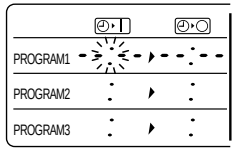
▼

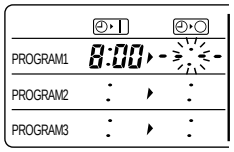
***2*** **Push (DAY) button, select the day for operation and then push (SET) button.**

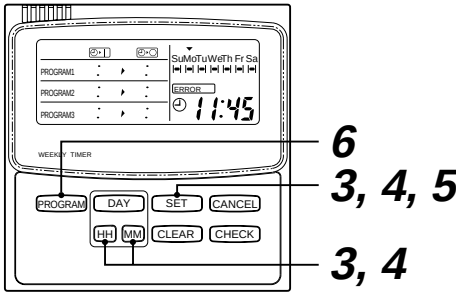
When pushing (SET) button, the flashed reserve mark ▬ changes, and ON time of the program 1 flashes at the same time.



**3** **Set ON time by HH, MM buttons, and then push SET button.**

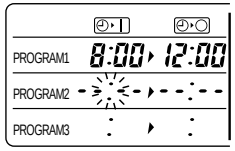
When push SET button, the flashed ON time (8:00 in example) change, and OFF time of the program 1 flashes at the same time.



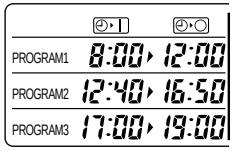

**4** **Set OFF time by HH / MM buttons, and then push SET button.**

When pushing SET button, the flashed ON time (12:00 in example) changes, and ON time of the program 2 flashes.




**5** **Next set up the operation time to the program 2 and 3.**

When pushing SET button after OFF time of the program 3 has been set, the flashed OFF time (19:00 in example) changes and ON time of the program 1 flashes.

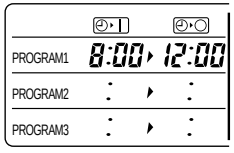



**6** **Finally, push PROGRAM button.**

Push PROGRAM button within 30 seconds after No. 5 step.

Then, one day timer (Monday in example) is set completely.

**ON/OFF is displayed when the present time is included in the range of the set time.**
(In the above status, the contents of the program 1 are displayed as the present time is included in the range from ON time to OFF time of the program 1.)




**7** Setting to other da y, repeat abo ve pr ocedure fr om ***1*** to ***6***.

If you need to set the same time as previous setting. Refer to "**7. How to copy the program operation time**".

**CAUTION**

- Setup of the program time : 0:00 is treated as 24:00.

  (Example) In the following cases, setup are available.

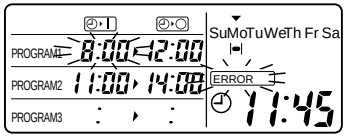
| ON time | OFF time |
|---|---|
| 0:00 | 2:00 |
| 22:00 | 0:00 |

- If 30 seconds have passed while the button is flashing without pushing DAY or HH / MM buttons, the display returns automatically to the original display (Normal display). In this case, repeat the procedure from the 1st step.

## 6. Set error

If flashing ERROR is displayed when the program operation has been set up, correct the time following the procedure below.

1. When flashing ERROR is displayed, ON time of the failed program flashes.



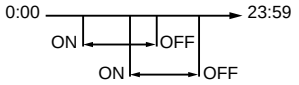

2. Push SET button to flash the time to be corrected.
3. Using HH / MM buttons, correct ON/OFF time.
4. Push SET button. When the setup is correctly performed, ERROR display disappears.
5. The correction has completed by pushing PROGRAM button.

**CAUTION**

- **When ON/OFF time is set as follows, ERROR is displayed.**

1) When a part of the operation time makes inroads into a part of another operation time

| Example: | ON time | OFF time |
|---|---|---|
| | 8:00 | 12:00 |
| | 11:00 | 14:00 |

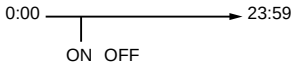



2) When OFF time is ahead of ON time

| Example: | ON time | OFF time |
|---|---|---|
| | 12:00 | 8:00 |

3) When ON time is same as OFF time

| Example: | ON time | OFF time |
|---|---|---|
| | 8:00 | 8:00 |



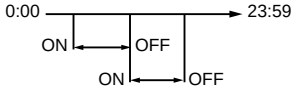

4) ON time or OFF time is singly set up

| Example: | ON time | OFF time |
|---|---|---|
| | 8:00 | [Is not set] |

- **The following cases are not set error.**

1) OFF time of the previous cycle is same as ON time of the next cycle.

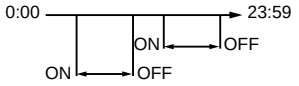
| Example: | ON time | OFF time |
|---|---|---|
| | 8:00 | 12:00 |
| | 12:00 | 19:00 |




2) When the next cycle is set to the time before the set time of the previous cycle

Example:

| ON time | OFF time | ⇨ | ON time | OFF time |
|---|---|---|---|---|
| 12:40 | 12:50 | | 12:40 | 16:50 |
| 8:00 | 12:00 | | 12:40 | 16:50 |




Pushing the PROGRAM button changes the order in order of time.

3) When both ON and OFF times are same 0:00

| Example: | ON time | OFF time |
|---|---|---|
| | 0:00 | 0:00 |

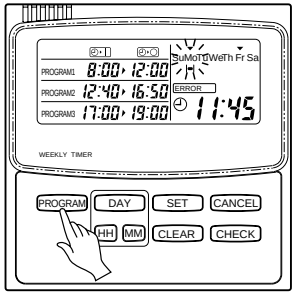
Continuous operation for 24 hours

## 7. How to copy the program operation time

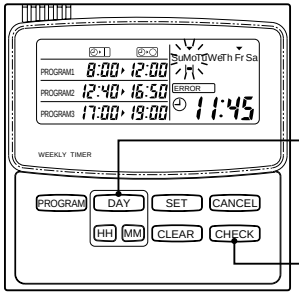
**When setting the program operation, already set program can be copied and set to the other day of the week.**

**<Example: To copy the operation contents of Monday to Tuesday>**

1. Push [CHECK] button in normal display.
2. Push [DAY] button and put the operation reserve indication ▬ on the day of the week of which the program operation is already set. (Monday in the example)
3. Push [PROGRAM] button. Present day of the week indication ▼ and Operation reserve indication ▬ flash.
4. Push [DAY] button and put the present day of the week indication ▼ on the day of the week to be copied. (Tuesday in the example) (For continuous copying, push [SET] button, and then push [DAY] button.)
5. Push [PROGRAM] button. The operation reserve indication ▬ goes on under the copied day of the week.




## 8. How to check the program operation time



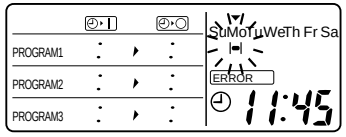

**CAUTION**

1. While reserve indication ▬ is flashing, the display does not change even if other buttons are pushed than [DAY], [CHECK], and [PROGRAM] button.
2. If 30 seconds have passed while the reserve indication ▬ is flashing without pushing [DAY], [CHECK] or [PROGRAM] button, the display returns automatically to the original display. (Normal display)

***1*** **Push [CHECK] button.**

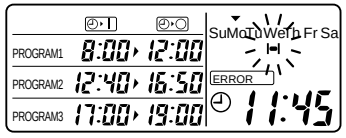
**<Example: Case to check the program operation time of Wednesday in Monday>**

- The operation reserve indication ▬ flashes in the normal display status.




***2*** **Push [DAY] button and put the operation reserve indication ▬ on the day of the week to be checked.**

- Every pushing [DAY] button, the operation reserve indication ▬ flashes and the contents of program operation time of the day of the week on which the operation reserve indication ▬ has been put on is displayed.

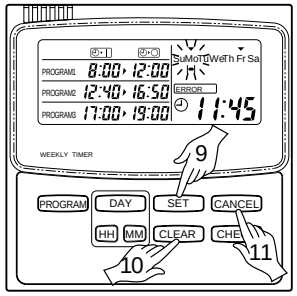


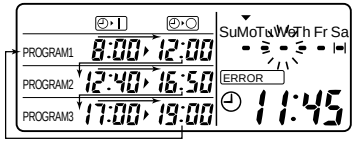

***3*** **Push [CHECK] button.**

- It turns to be normal indication.

## 9. How to change the program operation time

1. Push [PROGRAM] button in the normal display status.
2. Select the required day reserve mark ▬ by pushing [DAY] button.
3. Push [SET] button.
4. Each push [SET] button, the flashing part changes in the following figure. Put the indication on the time to be changed.
5. Using [HH] / [MM] buttons, change the time.
6. Push [SET] button.
7. Push [PROGRAM] button. Then the change operation has completed.




## 10. How to clear the program operation

- **Clear of the day of the week**
  1) Push [PROGRAM] button.
  2) Push [DAY] button and select the reserve mark ▬ to be cancelled.
  3) Push [CLEAR] button. The program time disappears.
  4) Push [PROGRAM] button. The operation reserve indication ▬ disappears.
- **Clear of a part of the program**
  1) Push [PROGRAM] button.
  2) Push [DAY] button and select the reserve mark ▬ on a to be cancelled.
  3) Push [SET] button.
  4) Push [SET] button again to flash ON or OFF time of the program to be cancelled.
  5) Push [CLEAR] button. Then, a part of the program has been cancelled. At the same time, the remained programs are automatically arranged.
  6) Push [PROGRAM] button.

## 11. How to set up the holiday

- **The operation reserve day can be cancelled by setting up the holiday.**
  1) Push [CANCEL] button. The holiday setup mark | | flashes.
  2) Push [DAY] button and select the holiday setup mark | | on the day which the holiday is set.
  3) Push [SET] button. The flashing holiday setup indication | | changes on. (|▬|)
- **Clearance of [HOLIDAY] setup**
  1) Push [CANCEL] button.
  2) Push [DAY] button and select the holiday setup mark | | on the day to which the holiday is cancelled.
  3) Push [SET] button. The holiday setup mark |▬| disappears and the operation reserve mark ▬ appears.
- **Explanation of operation**
  The cancel setting day is temporarily canceled, and from the next day, the cancel setup mark |▬| disappears and the operation reserve mark ▬ appears.

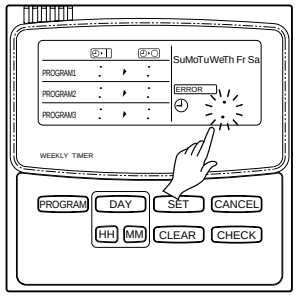
**CAUTION**

- For the day which does not set timer, the cancellation cannot be set.

## 12. Matters to be memorized

### 1. Power failure

When a power failure occurred and the power supply has been reset, the display of the right figure appears. (A colon " : " flashes.)

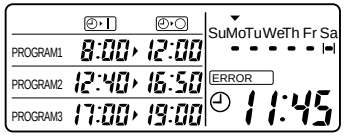



- **Resuming of operation**
  1) Turn on the power (breaker) of the air conditioner.
  2) Start operation by the remote controller.
  3) Push PROGRAM button of the program weekly timer. The flashing colon " : " changes to the clock display in the normal status. In this case, the program is memorized by the backup function. Therefore, it is unnecessary to set the program again.

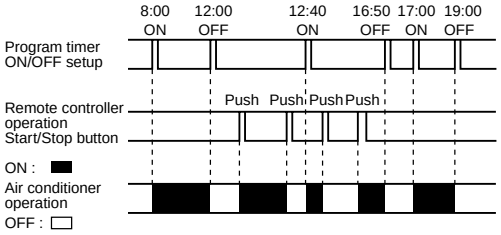
### 2. Operation of program weekly timer and air conditioner

**An air conditioner mounted with a program weekly timer is operated on a remote controller and on the program weekly timer.**

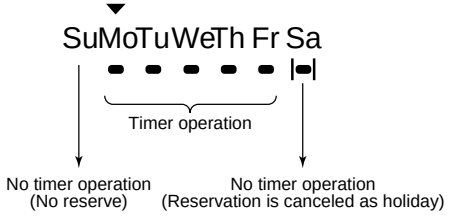
**(Example)**




1) Operation pattern in a day




2) Operation pattern in a week

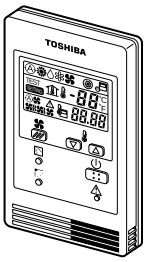


# OWNER'S MANUAL

## REMOTE CONTROLLER FOR AIR CONDITIONER

**<Simple Operation Type>**

# RBC-AS21E




TThank you very much for purchasing TOSHIBA Remote Controller for Air Conditioner.
Please read this owner's manual carefully before using your Remote Controller for Air Conditioner.

- Be sure to obtain the “Owner’s manual” and “Installation manual” from constructor (or dealer).

## CONTENTS

**PRECAUTIONS FOR SAFETY ..... 122**

**NAME AND OPERATION ..... 122**

**HOW TO OPERATE AIR CONDITIONER ..... 123**

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# PRECAUTIONS FOR SAFETY

## WARNING ⚠

### WARNINGS ABOUT INSTALLATION

- Make sure to ask the qualified installation professional in electric work to install the remote controller.
  If the remote controller is inappropriate installed by yourself, it may cause, electric shock, fire, and so on.

### WARNINGS ABOUT OPERATION

- When you are aware of something abnormal with the air conditioner (smells like something etc.), immediately turn off the main power supply switch or circuit breaker, from the mains to stop the air conditioner, and make contact with the dealer. If the air conditioner is continuously operated with something abnormal, it may cause machine failure, electric shock, fire, and so on.

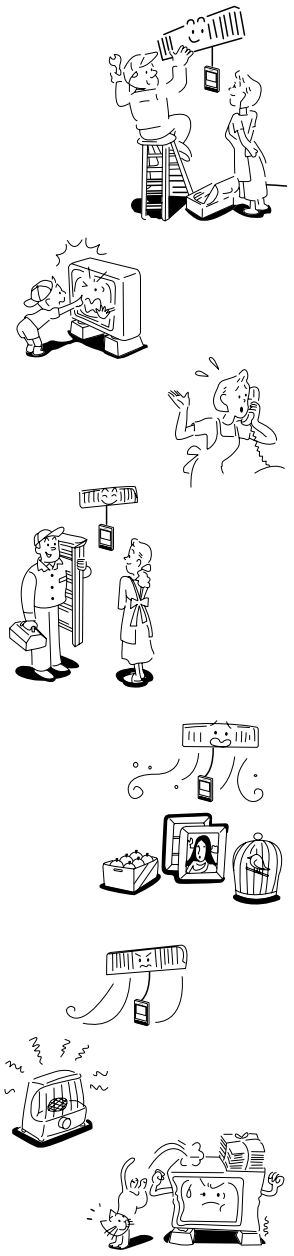
### WARNINGS ABOUT MOVEMENT AND REPAIR

- Do not repair any unit by yourself.
- Whenever the air conditioner needs repair, make sure to ask the dealer to do it. If it is repaired imperfectly, it may cause electric shock or fire.

## CAUTION

### CAUTIONS ABOUT OPERATION

- Carefully read this manual before starting the air conditioner. There are many important things for the safety and the correct usage.
- Do not touch any switches with wet finger, otherwise you may get an electric shock.
- When the air conditioner was not be used for a considerably long time, turn off the main switch or the circuit breaker, for safety. Disconnect from the power supply prevents the unit from lightning and power supply surge.
- Prevent any liquid from falling into the remote controller. Do not spill juice, water or any kind of liquid.

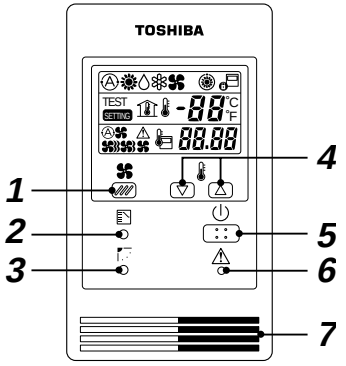


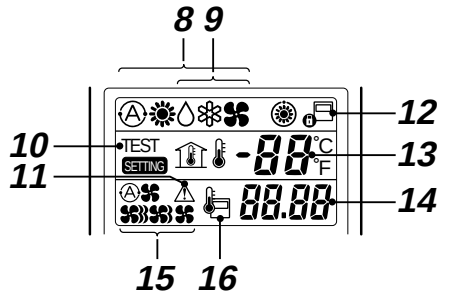


# NAME AND OPERATION

- For Cooling Only type, Ⓐ, ✹ and 🏠 are not displayed on LCD.
- Max. 8 indoor units can be operated by a remote controller.
- Once setting the operation items, you can operate the previous condition by pushing [ : : ] button only.

**<The following display is for explanation, so it differs from the real display.>**




**1** **Fan Speed button**

**2** **Operation mode button**

**3** **Swing/Air direction button**
The flap angle is changed.

**4** **Temperature Setup button**
Every pushing [△] button, temperature rises by 1˚C.
Every pushing [▽] button, temperature decrease by 1˚C.

**5** **(Start/Stop) button**

**6** **Check button (Used in servicing)**
- Do not use this button usually.

**7** **Remote control temperature sensor**
Usually controlled by the indoor unit sensor, it can be changed to the remote controller. For details, contact the shop which you purchased the air conditioner. (When using a group control method, do not use the remote controller sensor.)

**8** **Selected mode displays (Heat pump type)**
Any one of Ⓐ, ✹, 💧, ❄ or 🌀 displayed.
While 🏠 is displayed, the indoor fan stops or the mode is Low speed mode.

**9** **Selected mode displays (Cooling only type)**
Any one of 💧, ❄ or 🌀 is displayed.

**10** **TEST is displayed during Test Run.**

**11** **⚠ (CHECK) is displayed when the protective device worked or trouble occurred.**

**12** **is displayed during the operation.**
If the remote controller setting is prohibited by the central remote controller, flashes when [Start/Stop], [Operation Select] or [Temp. Setup] button is pushed and change is not accepted.

**13** **The setup temperature is displayed.**

**14** **Warning code is displayed when a trouble occurred.**

**15** **Selected fan speed, 🌀, 🌀, 🌀 or 🌀 displays.**

**16** **is displayed when the remote controller sensor is used.**

- When turning on the power switch of the simple operation type remote controller at the first time, flashes. While is displayed, the automatic model check is operating.
  Operate the remote controller after has disappeared.

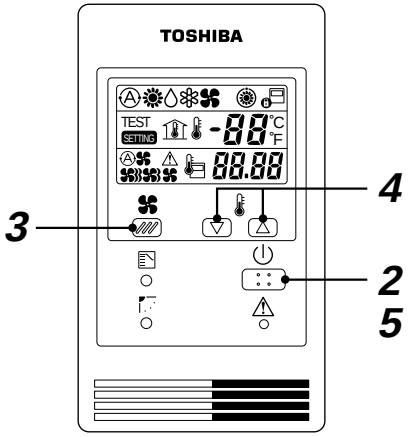
# HOW TO OPERATE AIR CONDITIONER

## COOL/HEAT AUTO, HEAT, DRY, COOL, FAN

**1 Power supply**

Turn on the power supply of the air conditioner 12 hours before starting the operation.

**2 Push ⏻ button.**




**3 Push ✣ button (▨) to select fan speed.**

When selecting AUTO, fan speed is automatically changed.
(During FAN mode, the air speed is not.)

**4 Push either ▽ or △ set to Auto.**

**<Recommended temperature>**

- During FAN mode, the temperature cannot be set up.

**5 Stop**

Push ⏻ button.

When stopping the unit by the remote controller, the fan of the outdoor unit, the fan or the outdoor unit may keep operating for a while even if the compressor of the outdoor unit has stopped.

---

- When the unit cannot be stopped by the remote controller.

  Turn off the main power switch or the leakage breaker, and then contact the shop which you purchased the unit.

- In heating, if the room is not enough heated with FAN ✣, select FAN ✣ or ✣.
- As the temperature sensed by the temp. sensor periphery of the suction port of the indoor unit, it differs from in the room according to the installation state. Set the temperature considering the setup value as the standard temperature in the room.

**Automatic Cool/Heat**

When all indoor units in the identical refrigerant system are controlled as a group and when all indoor units are installed in the same room, the cooling or heating operation is automatically performed with the difference between the setup temperature and the room temperature.

# TOSHIBA INSTALLATION MANUAL

## Ceiling Panel

**MODEL: RBC-U21PG (W)-E**

## Cautions on Safety

- **Before installation work, read this "Cautions on Safety" thoroughly.**
- **Strictly keep the following items in mind because they describe the serious contents concerned with safety. The indications and meanings are as follows:**
- After installation work, accompanied with a test run to check if there is no trouble, explain the use method and maintenance of the unit to the customers according to Owner's Manual. And also ask the customers to obtain this Ceiling Panel Installation Manual together with Owner's Manual and Installation Manual of the indoor unit.

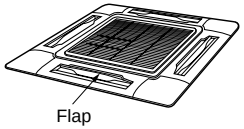
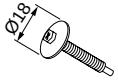
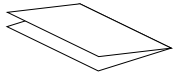
**⚠ WARNING**

- **Ask an authorized dealer or qualified installation professional to install the ceiling panel.**
  Inappropriate installation may result in water leakage, electric shock or fire if you install it by yourself.
- **Carry out an installation work securely according to this Installation Manual.**
  Inappropriate installation may result in water leakage, electric shock or fire.
- **A person qualified in the electric work should execute the electric works according to the Installation Manual and should use the exclusive circuits. The voltage should be matched with the rated voltage of the product.**
  The capacity shortage of electric circuit or inappropriate installation may result in electric shock or fire.

---

- **Never modify or repair the product.**
  Incomplete modification or repair may result in electric shock or fire.

## Components

| Name | Ceiling panel | Screw with washer | Screw | Installation manual |
|---|---|---|---|---|
| Q'ty | 1 | 4 ØM5mm x 40mm | 4 ØM4mm x 12mm | 1 |
| Shape |  Flap |  Ø18 | |  Ceiling Panel Installation Manual |

- **Never apply an excessive force on the flap. It causes a trouble.**

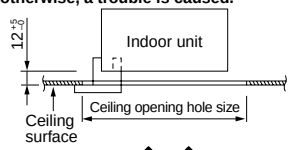
## 1. Preparation before installation of ceiling panel

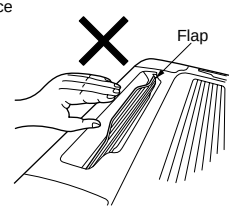
### *(1) Position check of indoor unit*

1. Check the position of the indoor unit according to the Installation Manual.
2. Check the size of the ceiling opening hole, applied the following range.
   860mm x 860mm to 910mm x 910mm
3. Using the installation gauge attached to the indoor packing, execute positioning of the ceiling surface and the indoor unit. If position of the ceiling surface does not match with position of the indoor unit, air leak, water leak (dewing), or malfunction of the flap is caused.

- **Never put the ceiling panel downward, lean it, or leave it on a projection to avoid a damage on the surface of the ceiling panel.**
- **Do not apply an excessive force on the flap when hanging it tentatively to the indoor unit. (It causes a trouble on the flap.)**

**Keep the range within 12 $^{+5}_{0}$, otherwise, a trouble is caused.**




## 2. Installation to indoor unit

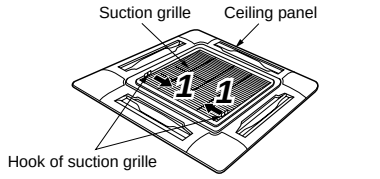
### *(1) Removal of suction grille*

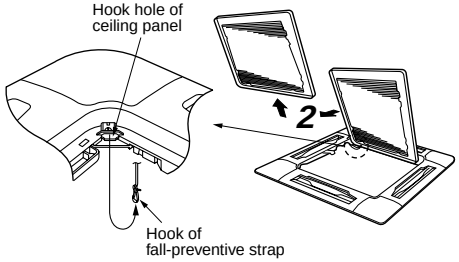
1. Open the suction grille by sliding the hook out of the suction grille along the arrow direction 1.

2 Take off hook of the fall-preventive strap from the ceiling panel.

- **Do not take off screws of the fall-preventive strap at the suction grille side.**

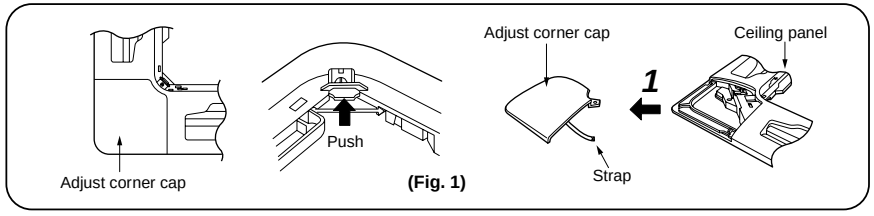
3. As the suction grille opened, remove the hinge section of the suction grille from the ceiling panel toward the arrow direction (2).




### *(2) Removal of adjust corner cap*

1. Slide the adjust corner cap along the arrow direction ***1***, and then remove the adjust corner cap. (Fig. 1)

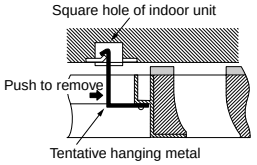



**(Fig. 1)**

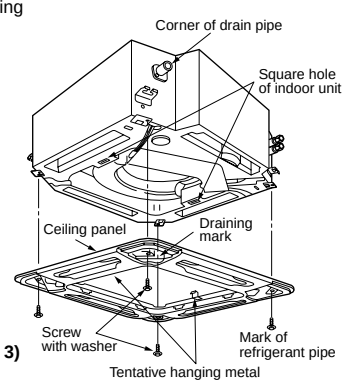
## *(3) Installation of ceiling panel*

**The angle change of the flap is possible while the power supply is turned on. (Do not move forcibly the flap with hands. It may break the flap.)**

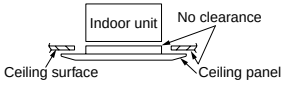
1. For tentative hanging, insert the tentative hanging metal (stainless) inside of the ceiling panel into the square hole of the indoor unit. (Fig. 2)
   - The ceiling panel has directional ability against the indoor unit. Direct the mark of **refrigerant pipe** at the ceiling panel corner toward the pipe side.
   - Holding the ceiling panel, remove it while pushing the tentative hanging metal toward the outside.
2. Match the mounting hole of the panel with the screw hole of the indoor unit.
3. Using the attached screws with washer, tighten 4 positions at corners of the suction port until the panel is fitted closely to the main unit. (Fig. 3)
4. Check the panel is fitted closely to the ceiling.
   - In this time, check there is no clearance between the indoor unit and the ceiling panel, and between the ceiling panel and the ceiling surface. (Fig. 4)




**(Fig. 2)**



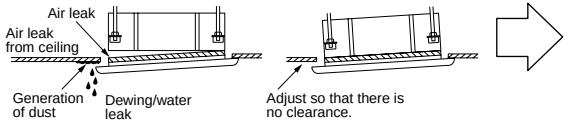

**(Fig. 3)**




**(Fig. 4)**

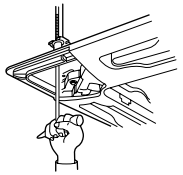
### CAUTIONS

- Tighten the screws securely because a trouble is caused as shown in the following figure if the screws are incompletely tightened.
- When there is a clearance between the ceiling surface and the ceiling panel even if the screws have been tightened, readjust height of the indoor unit.




**(Fig. 5)**

The height of the indoor unit can be adjusted from corner hole on the ceiling panel as the ceiling panel is installed if the adjustment does not affect the levelness of the indoor unit, drain pipe, etc.

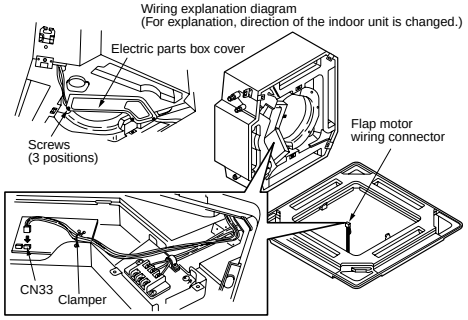


**(Fig. 6)**

After adjustment, be sure to tighten the mounting nut of the indoor unit securely.

## *(4) Cabling of ceiling panel*

1. Open cover of the electric parts box.
2. Connect the flap motor wiring connector out of the ceiling panel to the connector 5P (CN33: white) on P.C. board of the indoor unit.
   - **Connect the connector surely because the flap does not work if the connector is not connected.**
3. Mount cover of the electric parts box in the reverse procedure of opening of the cover.
   - **Check whether the wiring connector is pinched between the electric parts box and the cover or not.**
   - **Check whether the wiring connector is pinched between the indoor unit and the ceiling panel or not.**




As shown in the figure, pass the clamping material through inside of the slit.
After connection, store the connector section in the electric parts box.

**(Fig. 7)**

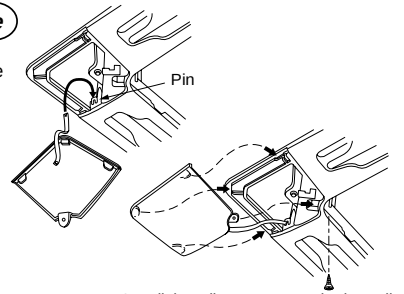
## *(5) Installation of adjust corner cap/suction grille*

Install the adjust corner cap/suction grille in the reverse procedure of **installation to the indoor unit.**

- For this ceiling panel, as shown in the following figure, the direction of the suction grille can be changed on customer's demand when multiple indoor units are installed.

### A. Installation of adjust corner cap

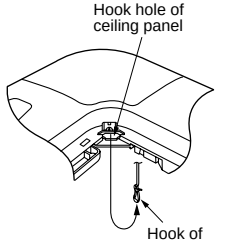
1. Hook the strap of the adjust corner cap surely to the pin on the ceiling panel.
2. Install the adjust corner cap to the ceiling panel, and fix it with the mounting screws. (accessory part)




Install the adjust corner cap horizontally to the ceiling surface so that 3 hooks of the adjust corner cap are set in holes of the ceiling panel. And then fix it with the mounting screws (accessory part).

### B. Installation of suction grille

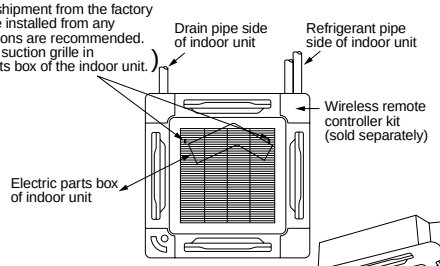
- To install the suction grille, follow to the reverse procedure of the removal. This ceiling panel can be installed from anyone of 4 directions by turning the suction grille. Change the direction on the customer's demand or according to the direction matching of the suction grille when multiple units are installed.
- **When installing the suction grille, be sure not to pinch the flap motor wiring connector.**
- Be sure to attach a strap to prevent falling of the suction grille to the ceiling panel.




**(Fig. 8)**

# 3. Others

Positions of suction grille hooks at shipment from the factory
* Although the suction grille can be installed from any position of 4 corners, these positions are recommended. (It is unnecessary to remove the suction grille in maintenance for the electric parts box of the indoor unit.)


Drain pipe side of indoor unit
Refrigerant pipe side of indoor unit
Wireless remote controller kit (sold separately)
Electric parts box of indoor unit

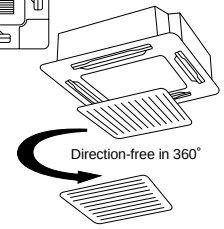
**(Fig. 9)**

### A. Check after installation

- Check again there is no clearance between the indoor unit and the ceiling panel, and between the ceiling panel and the ceiling surface.
  * A clearance causes water leak or dewing.
- Check the cables are connected surely.
  * Incomplete connection causes a trouble such as the flap does not work.

### B. For wireless remote controller

- For details of installation, refer to the Installation Manual attached to the wireless remote controller kit (sold separately).




**After confirmation of the above items, hand a set of this manual, manuals for the indoor unit, manual for products sold separately, etc. to the customer. For cleaning of the filter, be sure to ask the maintenance professional.**



EH99708701-(1) (EN)

# TOSHIBA INSTALLATION MANUAL To Personnel Charged in Installation (Electric) Work and Service

**Standard Remote Controller**
**MODEL : RBC-AMT21E**

## Accessory parts

| Part Name | Q'ty | Part Name | Q'ty |
|---|---|---|---|
| Remote controller (200mm-cable attached) | 1 | Spacer | 2 |
| Screw M4 x 25 | 2 | Wire joint | 2 |
| Wood screw | 2 | Installation Manual | 1 |

## Requirement to install the remote controller

### Installation place

- Install the remote controller at a position with height 1 to 1.5m from the floor, where the average temperature in the room can be felt.
- Do not install the remote controller at a place exposed to direct sunlight or direct outside air, such as a side of window, etc.
- Do not install the remote controller at a place behind something or rear side of something where air flow is poor in the room.
- Do not install the remote controller in the freezing box or refrigerator because water proof or drop-proof is not applied to this remote controller.
- Be sure to set the remote controller vertically on the wall surface, etc.

### How to select the room temperature sensor

The room temperature sensors are equipped in the indoor unit and remote controller.

One of two sensors works. Usually, the room temperature sensor in the indoor unit is set to work. To select the sensor in the remote controller side, refer to the following procedure.

1. Keep [🔧], [SET], and [CL] buttons pushed for 4 seconds or more.
   **NOTE)** The UNIT No. displayed at the first time is the indoor unit address of the master unit in the group control.
   **NOTE)** Do not push [UNIT] (select) button.
2. Using the temperature setup buttons [▲]/[▼], specify the item code (0032).
3. Using the timer buttons [▲]/[▼], change the set data from (0000) to (0001).
4. Push [SET] button.
   (OK if the display changes from flashing to lighting)
5. Push [🔧] button.
   The status returns to the normal status. In this time, 🌡 is displayed in LCD.

**NOTE 1 :**
When using two remote controllers, the master remote controller is recognized as 🌡 sensor though the temperature can be set from either master or sub remote controller.

**NOTE 2 :**
In a group control, the 🌡 sensor does not work if the group address is not set to the indoor unit of the master unit.

**NOTE 3 :**
When using the remote sensor together with the remote controller, do not use the 🌡 sensor of the remote controller.

## How to install remote controller

**NOTE 1 :** Avoid to twist the remote controller cable with power supply cable, etc. or to store them in the same metal pipe, otherwise it causes a malfunction.

**NOTE 2 :** Install the remote controller apart from the generation source of noise.

**NOTE 3 :** When noise is contained to the unit power supply, counter measures such as mounting the noise filter is necessary.

- **When using the remote controller as exposed, install it at the wall surface where it can be fixed.**

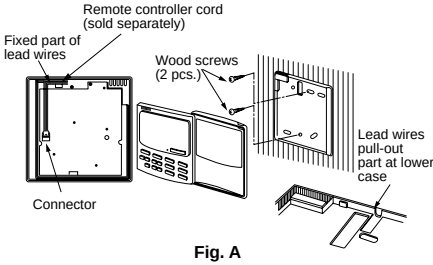
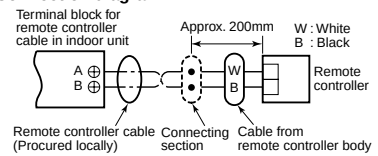

Remote controller cord (sold separately)
Fixed part of lead wires
Wood screws (2 pcs.)
Lead wires pull-out part at lower case
Connector

**Fig. A**

1. For removal and mounting of the remote controller body and the rear case, refer to the item, "Using as concealed type".
2. Remove the lead wires wound to the fixing part of lead wires of the remote controller body, remove the connectors, and then connect the remote controller cable (sold separately) to the connector section of the remote controller body. Insert the remote controller cable into the groove and form it, and wind it around the fixing part of lead wires.
   Notching the lower case (thin part of the upper center part) with nipper, etc., pull out the remote controller cables from this part. (Fig. A) (Refer to the item, "How to perform cabling of the remote controller".)
   **Connect cables of the remote controller after check of terminal No. of the indoor unit so that there is no miswiring. (Do not apply AC 200/230/240V to the remote controller.)**
3. Fix the remote controller body by two wood screws.
4. Using the cable clips (Accessory of remote controller cable sold separately), fix the remote controller cable to the wall surface.

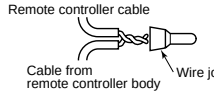
## How to perform cabling of the remote controller

- **Connection diagram**




- Non polarity, 2 core cable is used.
- Use 0.5mm² to 2mm² cable.

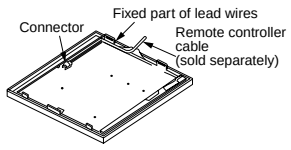
Attached wire joint (White, 2 pcs.)




1) Peel the sheath of the cable to be connected by approx. 14mm.
2) Twist two cables and pressure-connect them using a wire joint.
3) When an exclusive pressure-connecting tool is not used or soldering connection is used, apply insulation process with an insulation tape.

- For cabling of the remote controller, use the remote controller cable (sold separately).

1. Remove the lead wires wound to the fixing part of lead wires of the remote controller body, remove the connectors, and then connect the remote controller cable (sold separately) to the connector section of the remote controller body. Insert the remote controller cable (sold separately) into the groove and form it, and wind it around the fixing part of lead wires.
2. When using the remote controller cable (sold separately), refer to the Installation Manual attached to the remote controller cable.

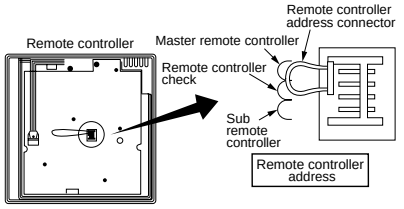



## Remote controller test run setup

1. When the remote controller is used at the first time, it accepts an operation approx. 5 minutes after the power supply has been turned on. It is not a trouble, but is because the setup of the remote controller is being checked.
2. Push [:: ⏻] key after [TEST] has been displayed on LCD by keeping [🔧] button on the remote controller for 4 seconds or more.
   - During the test run, [TEST] is displayed on LCD.
   - The temperature cannot be controlled if [TEST] is displayed.
     Do not use [TEST] in a case other than a test run, otherwise an excessive load is applied on the machine.
3. Use [TEST] in one of HEAT, COOL, and FAN operation modes.
   **NOTE :** The outdoor unit does not operate for approx. 3 minutes after the power supply has been turned on or the operation has stopped.
4. After the test run has finished, push [🔧] button again to check [TEST] on LCD has gone off.
   (For this remote controller, a release function of 60 minutes timer is provided to prevent continuous test runs.)

## Requirement for installation of multiple remote controllers

"2 remote controllers" means that one or multiple units are operated by the multiple remote controllers.
(Max. 2 remote controllers can be set.)




- **How to install**

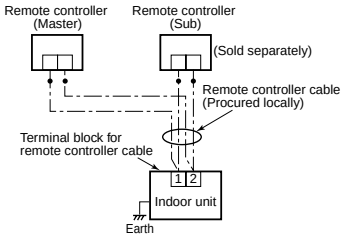
For 2 remote controllers, install the remote controllers in the following procedure.

1. Set one of two remote controllers as the master remote controller. (At shipment from factory)
2. For the other remote controller, exchange the remote controller address connector of the master to sub remote controller on the P.C. board. Under this condition, the other remote controller functions as the sub controller.

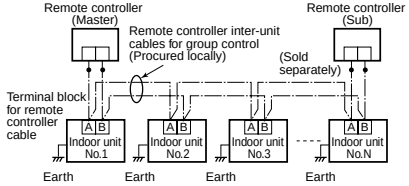
- **Basic wiring diagram**

**NOTE :**
Connect cables without miswiring.
(Miswiring breaks the unit.)

- In a case to operate an indoor unit from the remote controllers at two positions




- In a case to operate a group control of multiple indoor units from the remote controllers at two positions
  ★Master and Sub remote controllers are operable even if they are installed to any indoor unit.



# TOSHIBA INSTALLATION MANUAL

**To Personnel Charged in Installation (Electric) Work and Service**

**Simple Remote Controller**
**MODEL : RBC-AS21E**

## Accessory parts

| Part Name | Q'ty | Part Name | Q'ty |
|---|---|---|---|
| Remote controller (200mm-cable attached) | 1 | Spacer | 2 |
| | | Wire joint | 2 |
| Screw M4 x 25 | 2 | Clamper | 1 |
| Wood screw | 2 | Installation Manual | 1 |

## Requirement to install the remote controller

### Installation place

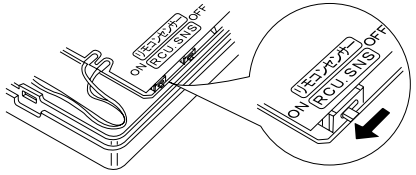
- Install the remote controller at a position within 1 to 1.5m from the floor, where the average temperature in the room can be felt.
- Do not install the remote controller at a place exposed to direct sunlight or direct outside air, such as a side of window, etc.
- Do not install the remote controller at a place behind something or rear side of something, where air flow is poor in the room.
- Do not install the remote controller in the freezing box or refrigerator because water proof or drop-proof is not applied to this remote controller.
- Be sure to set the remote controller vertically on the wall surface, etc.

### How to select the room temp. sensor

The room temperature sensors are equipped in the indoor unit and the remote controller.
One of two sensors works. Usually, the room temperature sensor in the indoor unit is set to work. To select the sensor in the remote controller, turn the remote controller sensor from OFF to ON.

**NOTE 1 :**
Selecting the sensor in the remote controller is impossible on the sub remote controller.

**NOTE 2 :**
Do not select the sensor in the remote controller when a remote controller sensor is used. (Because it causes a straying.)



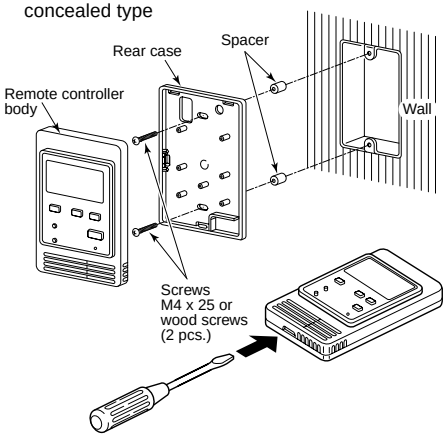

## How to install the remote controller switch

**NOTE 1 :**
Avoid to twist the remote controller cable with the power supply cable, etc. or to store them in the same metal pipe, otherwise it causes a malfunction.

**NOTE 2 :**
Install the remote controller apart from the generation source of noise.

**NOTE 3 :**
When noise is contained to the power source of the indoor unit, counter measures such as mounting the noise filter is necessary.

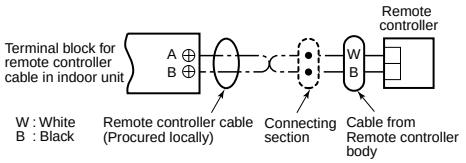
- In case of using the remote controller as a concealed type




1. Inserting a minus screwdriver, etc. into the groove at the lower side of the remote controller body, force open the rear case to remove it.
2. Using the attached M4 screws (2 pcs.), fix the rear case of the remote controller.
   Before installation, press to open the screw hole with a screwdriver, etc.
   Fix it with the spacer, but not so strongly. If the remote controller does not fit closely to the wall, adjust it by cutting off the spacer.
3. Connect the remote controller cable (2 cores) to the cable from the remote controller body.
   Connect the remote controller cable without miswiring upon confirmation of the terminal numbers of the indoor unit. (If applyied AC 220/230/240V, may damage the unit.)
4. Install the remote controller body to hooks on the rear case and putting into the hooks.

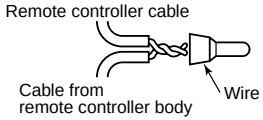
## How to perform cabling of the remote controller

- **Connection diagram**




- Non polarity, 2 core cable is used.
- Use 0.5mm² to 2 mm² cable.

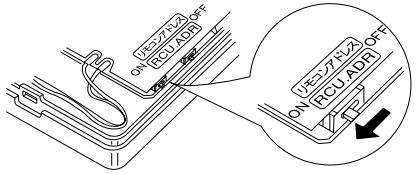
Attached wire joint (White, 2 pcs.)




1) Peel the sheath of cable to be connected by approx. 14mm.
2) Twist two cables and pressure-connect them using a wire joint.
3) When an exclusive pressure-connecting tool is not used or soldering connection is used, apply insulation process with an insulation tape.

## Requirement for installation of multiple remote controllers

"2 remote controller control" means that one or multiple units are operated by the multiple remote controllers.




- **How to install**

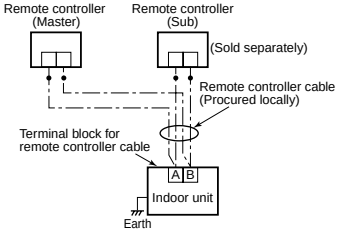
For 2 remote controller control, install the remote controllers in the following procedure.

1. Set one of the set multiple remote controllers to the master remote controller.
   (At shipment from factory)
2. For other remote controllers, turn the remote controller address switch on the remote controller P.C. board from OFF to ON. They function as sub remote controllers under the above condition.

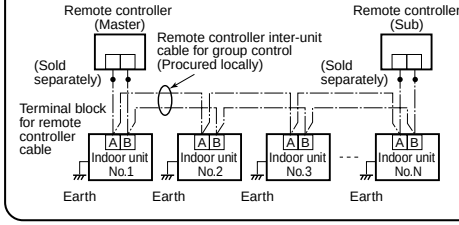
- **Basic cabling diagram**

**NOTE :**
Connect cables without miswiring.
(Miswiring breaks the unit.)

- In a case to operate an indoor unit from the remote controllers at two positions




- In a case to operate a group control of multiple indoor units from the remote controllers at two positions
  * Master and sub remote controllers are operable even if they are installed to any indoor unit.




## Remote controller test run setup

1. Push ⏻ key after keeping [CHECK] button pushed on the remote controller for 4 seconds or more.
   - During the test run, "TEST" is displayed on LCD.
   - The temperature cannot be controlled if [TEST] is displayed. Do not use [TEST] in a case other than a test run, otherwise an excessive load is applied on the machine.
2. **Use [TEST] in one of HEAT, COOL, and FAN operation modes.**

**NOTE :**
The outdoor unit does not operate for approx. 3 minutes after the power supply has been turned on or the operation has stopped.

3. After the test run has finished, push [CHECK] button again to check "TEST" on LCD has gone off. (For this remote controller, a release function of 60 minutes timer is provided to prevent consecutive test runs.)



85464359428000 (EN)

# TOSHIBA INSTALLATION MANUAL To Personnel Charged in Installation (Electric) Work and Service

**Program Weekly Timer**
**MODEL : RBC-EXW21E**

## Accessory parts

| Part Name | Q'ty |
|---|---|
| Program weekly timer | 1 |
| Connecting cable (Length: 1.2m) | 1 |
| Screws M4 x 25 | 2 |
| Wood screws | 2 |
| Spacer | 2 |
| Owner's Manual | 1 |
| Installation Manual | 1 |

## Requirement to install the program weekly timer

**Installing dimension for serial installation**

When installing the program weekly timer (remote controller/system controller, etc.) to the wall surface, follow the installation procedure in (Fig. 1) and (Fig. 2).

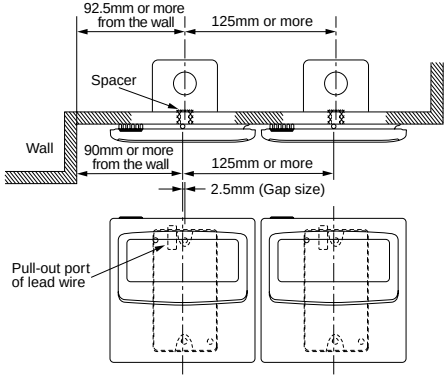



**Fig. 1**

*When installing the remote controller and the program weekly timer which are set in parallel at upper side and lower side, in consideration of maintenance, keep a clearance with 25mm or more.

## How to install the program weekly timer

**NOTE 1 :**

Avoid to twist the program weekly timer cable with the power supply cable, etc. or to store them in the same metal pipe, otherwise it causes a malfunction.

**NOTE 2 :**

Install the program weekly timer apart from the generation source of noise.

**NOTE 3 :**

When noise is induced to the power source of the indoor unit, measures such as mounting the noise filter is necessary.

- Install the program weekly timer to the box (Procured locally) which has previously inserted in the wall.

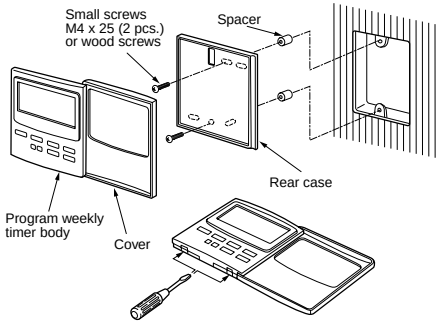
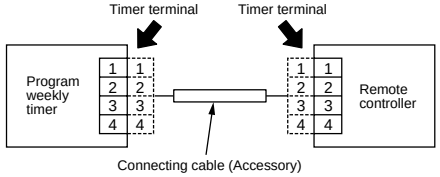



**Fig. 2**

1. Inserting a minus screwdriver, etc. into the groove at the lower side of the program weekly timer, which appears when opening lid of the program weekly timer body, force open the rear case to remove it.
2. Using the attached M4 screws or wood screws (2 pcs.), fix the rear case of the program weekly timer. Before installation, press to open the screw hole with a screwdriver, etc.
   Fix it with the spacer, but not so strongly. If the program weekly timer does not fit closely to the wall, adjust it by cutting off the spacer.
3. Connect the attached connecting cable (4 cores) to the program weekly timer body.
4. Install the program weekly timer body by matching to hooks on the rear case and putting into the hooks.

## Cabling

- **Connection diagram (Be sure to use the attached connecting cable.)**




- **Arrangement**

  The program weekly timer and the remote controller can be arranged to either right or left side.

- **Cabling procedure**

Perform cabling in the following procedure.

1. Connect the attached connecting cable to the timer terminal (4P connector) of the program weekly timer. (Fig. 3)

**<Remote controller> <Program weekly timer>**

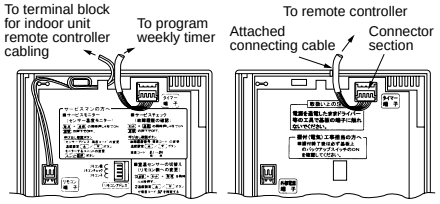
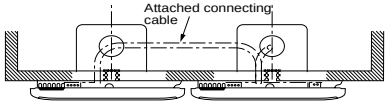

To terminal block for indoor unit remote controller cabling
To program weekly timer
To remote controller
Attached connecting cable
Connector section

**Fig. 3**

2. Pull the attached cable out of lead wire pull-out port on the rear case of the program weekly timer and connect the cable to the timer terminal (4P connector) of the remote controller via inside of the wall. (Fig. 4)




**<Program weekly timer> <Remote controller>**

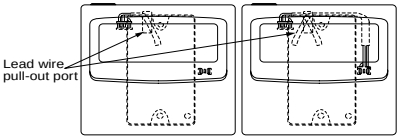
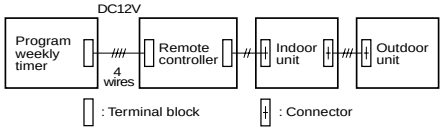


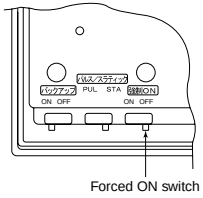

**Fig. 4**

- **System diagram**




## Program weekly timer test run setup

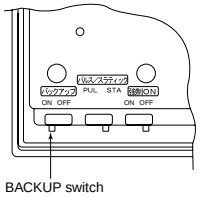
- After installation, check (OFF to ON) output status using the forced ON switch on the rear side of the program weekly timer P.C. board. Then check the normal operation and **certainly turn OFF the forced ON switch.**




## Memory backup function for power failure compensation

- This program weekly timer stores in memory the contents set by the operation button during a power failure. Pushing (PROGRAM) button resumes the operation with the contents before the power failure when the power failure has been reset.
- **How to use [BACKUP]**

  After the installation work, check [BACKUP] switch on the rear side of the program weekly timer P.C. board is turned to ON side.




## Explanation to customers

- After the installation work, hand "Owner's Manual" and "Installation Manual" to the customers.
- Explain use and maintenance methods to the customers according to "Owner's Manual".



85464359429000 (EN)

# TOSHIBA INSTALLATION MANUAL

**Remote sensor**
**MODEL : TCB-TC21LE**

**To Personnel Charged in Installation (Electric) Work and Service**

## Accessory parts

| Part Name | Q'ty | Part Name | Q'ty |
|---|---|---|---|
| Remote sensor (200mm-cable attached) | 1 | Spacer | 2 |
| Small screw M4 x 25 | 2 | Wire joint | 2 |
| Wood screw | 2 | Cable clamper | 1 |
| | | Installation Manual | 1 |

## Requirement to install the remote sensor

**Installation place**

- Install the remote sensor at a position with height 1 to 1.5m from the floor, where the average temperature in the room can be felt.
- Do not install the remote sensor at a place exposed to the direct sunlight or direct outside air, such as a side of window, etc.
- Do not install the remote sensor at a place behind something or rear side of something, where air flow is poor in the room.
- Do not install the remote controller near the freezing box or refrigerator because water proof or drop-proof is not applied to this remote controller.
- Be sure to set the remote sensor vertically on the wall surface, etc.

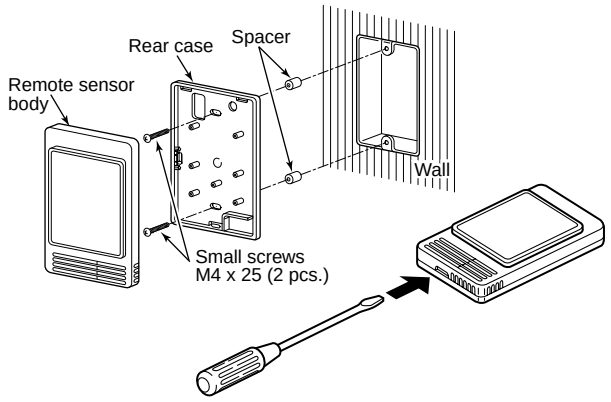
## How to install the remote sensor

**NOTE 1 :** Avoid to twist the remote sensor cable with the power supply cable, etc. or to store them in the same metal pipe, otherwise it causes a malfunction.

**NOTE 2 :** Install the remote sensor apart from the generation source of noise.

**NOTE 3 :** When noise is induced to the power source of the indoor unit, some measures such as mounting the noise filter is necessary.

- In case of using the remote sensor as a concealed type



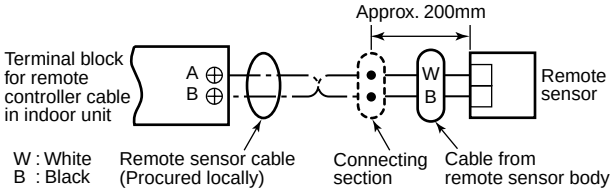

1. Inserting a minus screwdriver, etc. into the groove at the lower side of the remote sensor body, force open the rear case to remove it.
2. Using the attached M4 screws (2 pcs.), fix the rear case of the remote sensor. Before installation, press to open the screw hole with a screwdriver, etc.

   Fix it with the spacer, but not so strongly. If the remote sensor does not fit closely to the wall, adjust it by cutting off the spacer.
3. Connect the remote sensor cable (2 cores) to the terminal numbers of the indoor unit. (Applying AC 220/230/240V breaks the unit.)
4. Install the remote sensor body by matching to hooks on the rear case and putting into the hooks.

## How to perform cabling of the remote sensor

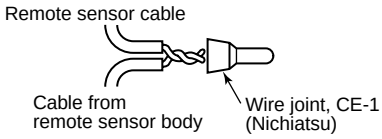
**In case of using the remote sensor as a concealed type**

- **Connection diagram**




- Non polarity, 2 core cable is used..
- Use 0.5mm² to 2 mm² cable.

Attached wire joint (White, 2 pcs.)



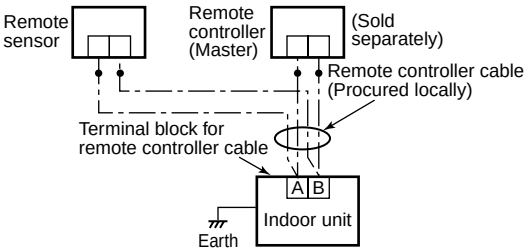

1) Peel the sheath of the cable to be connected by approx. 14mm.
2) Twist two cables and pressure-connect them using a wire joint.
3) When an exclusive pressure-connecting tool is not used or soldering connection is used, apply insulation process with an insulation tape.

## Requirement for using the remote sensor together with the remote controller

- **How to install**

  For the above control, install the remote sensor in the following procedure.
  1. Set the remote controller as the master remote controller.
  2. Do not change the remote sensor switch in the master remote controller for correct temperature control by remote sensor.

- **Basic cabling diagram**
  1. Connect cables without miswiring. (Miswiring breaks the unit.)
  2. In a case to operate an indoor unit from the remote sensors and the remote controller.



# TOSHIBA

# INSTALLATION MANUAL

## Drain-up Kit
## for Concealed Duct Type Indoor Unit

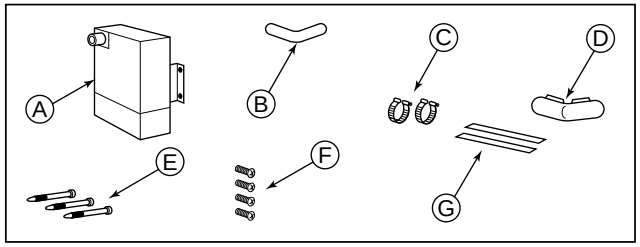
## MODEL: TCB-DP11BE

**⚠ WARNING**

- **Ask the qualified installation professional to install the drain up kit.**
  If drain up kit is inappropriate installed by yourself, it may cause a water leak, an electric shock fire and so on.
- **Install the drain up kit surely according to this installation manual.**
- **When re-install the drain up kit, also ask the qualified installation professional to install it.**
  If drain up kit is installed by yourself, it may cause a water leak, an electric shock fire and so on.

## *Configuration*

| | Name | Q'ty | | Name | Q'ty |
|---|---|---|---|---|---|
| A | Drain up kit body | 1 | E | Bundling band | 3 |
| B | Drain hose | 1 | F | Tapping screw | 4 |
| C | Hose band | 2 | G | Thermal insulation tape | 2 |
| D | Thermal insulation pipe | 1 | | | |




**REQUIREMENT**

- Be sure to install the drain up kit correctly according to the procedure described in this Installation Manual. Otherwise, the position of the drain pan on the drain up kit does not match with one on the air conditioner body, resulting in a water leak.
- Check the level of the air conditioner.
  (Check that it is horizontally set or the drain port side of the air conditioner is set with an inclination within 1˚ downward.)
- Be sure to make a check port to the lower ceiling part of the drain up kit.

## *How to install drain-up kit*

### 1. Installation of drain-up kit body (See Fig. 1.)

Open the cover of drain-up kit body, align the position and fasten the body using the attached 4 tapping screws.

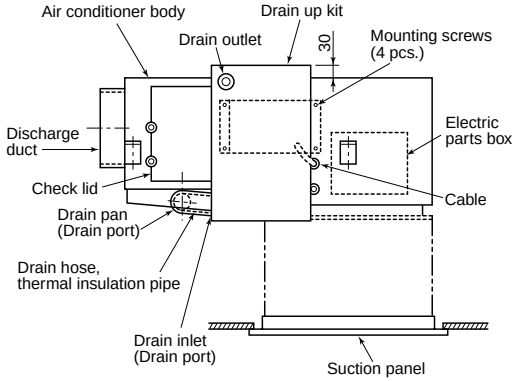
### 2. Hose connection (See Fig. 1.)

- First connect the drain hose to pipe at the drain port of the drain up kit, and then connect it to the drain port of the air conditioner body.
  Tighten the both ends of the drain hose with hose band. In this time, be sure to set the screw section of the hose band toward upper side.
- Apply thermal insulation the drain hose with the attached thermal insulation pipe.
  Set the both ends of the drain hose closely to the drain pan.
- If a gap is generated on the matched section of the thermal insulation materials at the both ends, seal the section by winding the thermal insulation tape.

### 3. Drain piping

- Be sure to set the drain pipe from the drain up kit with falling gradient. Support and fix the drain pipe at an appropriate position so that an excessive load is not applied on the drain port.
- Be sure to apply thermal insulation (procured locally) to the drain pipe.

**<Fig. 1>**

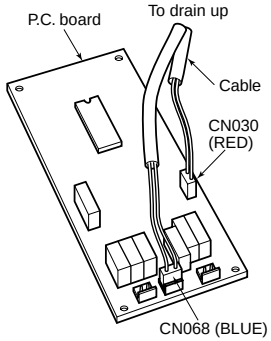



* Using the hose band, tighten the drain port and drain inlet of the drain pan. Also, be sure to set the screw section of the hose band toward upper side.

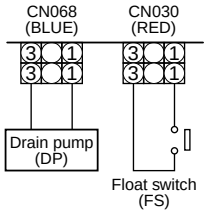
### 4. Cabling (See Fig. 2.)

- Remove cover of the electric parts box of the air conditioner body.
- Insert 3P connector (BLUE) of the drain up kit into the terminal No. CN068 (BLUE) in the electric parts box.
- Remove the short circuit connector (No. CN030) on the P.C. board in electric parts box.
- Insert 3P connector (RED) of the drain up kit into the terminal No. CN030 (RED) (Short-circuit connector is not used.)
- Clamp the cable in the electric parts box.

**<Fig. 2>**




**<Fig. 3>**




Arrange the cables so that they do not apply a tension upon the drain-up kit body and the connector section.

## *Test run*

### Condition check of water drain

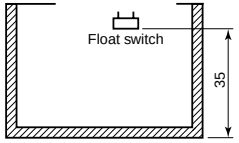
After the electric work and cabling work, check the drain is smoothly discharged by running the air conditioner in COOL mode.

- If the cooling operation does not continue for a long time, pour water into the drain pan of the air conditioner body to check whether the drain is smoothly discharged or not.
- Check there is no water leak at each connecting section.

### Operation check of float switch

- During cooling operation, operate the float switch.
  Check the air conditioner stops the cooling operation under condition that the drain pump keeps operating.
- After operation in COOL mode, operate the float switch.
  In this time, check that the drain pump works to discharge the drain.

**<Position of float switch>**




- To handle the float switch, remove the front panel of the kit and push up the floating section of the float switch with a screwdriver, etc.
- Be careful not to operate the float switch consecutively for 2 minutes or more because the air conditioner stops abnormally.

## *Maintenance/Check*

In order to put the function of the air conditioner and the drain-up kit fully to practical use, the regular maintenance and check are necessary, together with correct usage.

For the air conditioner body and the drain-up kit especially, **check dirt of the drain pan once per year before cooling season and clean them if dirt is heavy.**

- It is recommended to make a contract with the customers for maintenance and check.

EH99824201 (EN)

# TOSHIBA INSTALLATION MANUAL

**To Personnel Charged in Installation Work and Service**

**Remote Controller Wireless Kit**
**MODEL : TCB-AX21U (W)-E**

## Accessory parts

| Part Name | Q'ty | Part Name | Q'ty |
|---|---|---|---|
| Sensor unit | 1 | Battery | 2 |
| | | Owner's Manual | 1 |
| | | Tapping screw M4 x 16mm | 2 |
| Remote controller | 1 | Clamper | 1 |
| Remote controller holder | 1 | Fixing screw M4 x 12mm | 1 |

- **How to set the fan motor speed refer to the OWNER'S MANUAL**

## How to install the sensors

* The positions where the sensors can be installed are limited to the corners (**A**) in Fig. 1. Therefore, for installation of the sensor units, consider the direction when a panel is installed to the indoor unit.

1. Remove the suction grille.
2. Take off the screw fixing the corner cap and remove the corner cap sliding it side-ward. (Fig. 2)

**Fig. 1**

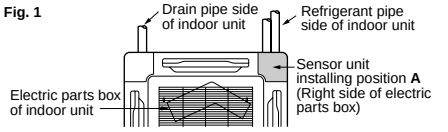
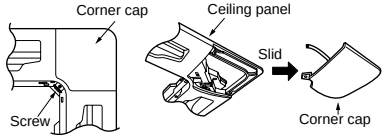
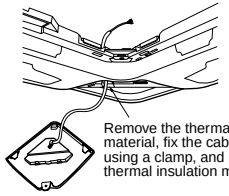

Drain pipe side of indoor unit
Refrigerant pipe side of indoor unit
Sensor unit installing position **A** (Right side of electric parts box)
Electric parts box of indoor unit

**Fig. 2**



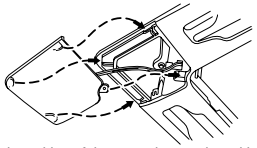

3. The thermal insulation material is stuffed in the square hole provided to pass through cables of the panel, so take off it once and pass the cable out of the sensor of wireless remote controller through the grille. Using a clamp, fix the cable with screws and then be sure to stuff again the removed thermal insulation material as original. (Fig. 3)
   If the thermal insulation material is not stuffed, dewing may happen.

**Fig. 3**


Remove the thermal insulation material, fix the cable with screws using a clamp, and put in the thermal insulation material again.

4. After cabling according to "How to perform cabling of sensor units", remain the cable length enough to remove the sensor unit and fix it with screws using a clamp. (Fig. 3)
5. Install the sensor units to the panel. In this time, slide the panel so that the hooks are fit in completely at 3 positions.
   And also be careful not to pinch the cable. (Fig. 4)

**Fig. 4**

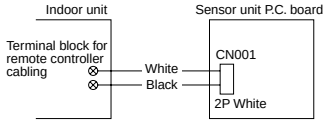


**NOTES :**

1. Avoid to twist the cables of the operation section with cables of the power supply, etc. It causes a malfunction.
2. When noise is contained to the power supply of the indoor unit, counter measures such as mounting the noise filter is necessary.

## How to perform cabling of sensor units

**Connection diagram**




**Connection**

- Connect the cables out of the sensor unit to the terminal block for remote controller cabling of the indoor unit. (There is no polarity.)

## Requirement

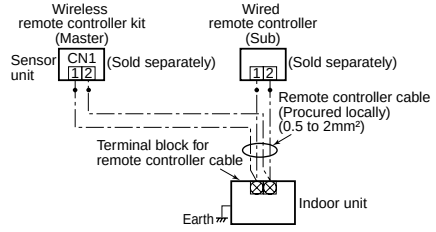
The control by two remote controllers is enabled by installing the wireless remote controller with the wired remote controller for an indoor unit.
(Max. 2 remote controllers of wireless or wired are installable.)
"2-remote controllers" controlling means that one or multiple units are operated by the multiple remote controllers.

**NOTES :**

1. Upon confirmation of the terminal numbers of the indoor unit, connect the remote controller cables without miscabling. (If applied AC 220/230/240 Volt, damage the unit.)
2. The multiple wireless remote controller kits cannot concurrently be used for an indoor unit.
3. When installing simultaneously the wireless remote controller with the wired remote controller, set one of them as the sub remote controller.
   - When setting the wired remote controller as the sub, exchange the address connector at the rear of P.C. board of wired remote controller from master to sub remote controller.
   - When setting the wireless remote controller as the sub, turn No.3 of DIP switch [S003] on P.C. board of wireless remote controller sensor unit from OFF to ON.

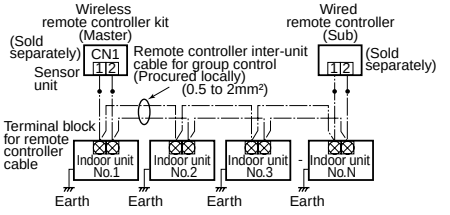
**To operate an indoor unit by 2 remote controllers**

* The indoor unit is operated if either wireless or wired remote controller is set as master or sub remote controller.
(Total cable length: Within 400m)



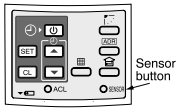

**To operate a group control of multiple indoor units by 2 remote controllers**

* Master and Sub remote controllers are operable even if they are installed to any indoor unit.
(Total cable length: Within 200m)




## How to set the room temperature sensor

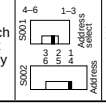
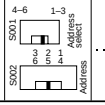
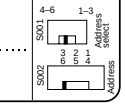
- The room temperature sensors are equipped in the indoor unit and the wireless remote controller. One of two sensors works.
- The room temperature sensor is set to the indoor unit side at the shipment from the factory. To select the sensor in the remote controller, push the SENSOR button (Right figure) inside of the remote controller cover and check "Main sensor" disappears from LCD.




**NOTE :**
If the room temperature data from the remote controller is not transmitted to the unit for 10 minutes or more, the sensor at indoor unit side is automatically selected even if the sensor at the remote controller side is selected. Fix the remote controller toward the unit as possible.

## How to set the address switch

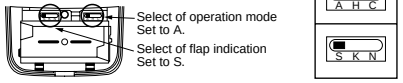
- When the multiple sensors are installed in the same room, an address can be set to prevent cross communication.
- When replacing the battery and pushing SET button, the address of the remote controller becomes [ALL] and the sensor is enabled to receive signal regardless of setting of address switch of the operation section.
- For selecting of the remote controller address, refer to Owner's Manual.
- Change the address of the sensor by removing screws of P.C. board cover of the sensor unit. After then, fix the cover with screws using a clamp.

| Display of remote controller address | Address ALL | Address 1 | Address 2 | ..... | Address 6 |
|---|---|---|---|---|---|
| Address switch position of sensor | * Address switch of sensor unit can be set any position. |  |  | ..... |  |



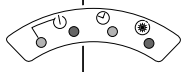
## Slide switch

- Check the slide switch in the battery box of the remote controller is set to [S] / [A] at shipment from the factory.
Do not change the setting.




## Self-diagnosis table and measures

| Lamp indication | Cause | Measures |
|---|---|---|
| No indication even if the remote controller is operated. | Power supply is not turned on. Miscabling between sensor unit and indoor unit | Check cable connection and correct it. |
| | Defective connection between sensor unit and indoor unit | |
| | Miscabling or defective connection between indoor and outdoor units | |
| Flashes alternatively | Protective device of outdoor unit works. | Check outdoor unit. |
| Flashes alternatively | Protective device of indoor unit works. | Check indoor unit. |

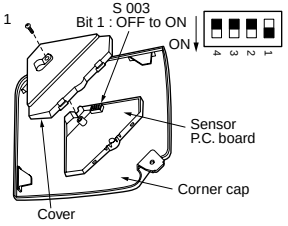


**Lamp indication of sensor**
● : Goes off
☼ : Flash (0.5-sec. interval)

## Test run

- **How to use [TEST]**

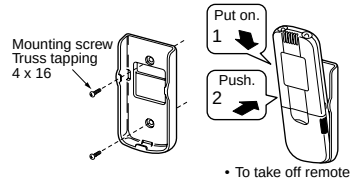
1. Turn No.1 of DIP switch [S003] on sensor P.C. board from OFF to ON.
2. During the test run, all the indication lamps on LCD flash.
3. During the test run, the temperature cannot be controlled.
4. After the test run, be sure to turn DIP switch 1 from ON to OFF and check the indication lamps do not flash.
   Use [TEST] function only for a test run, otherwise the unit is overloaded. Fix the cover as original.




## How to handle the remote contr oller

- **In case using remote controller mounting to the wall, etc.**

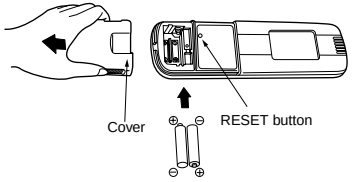
Check a signal is received correctly by pushing ⏻ button at the position to be fixed.




• To take off remote controller, pull it toward you.

- **Replacement of battery**

1. Holding the both ends of the cover and remove it by sliding downward.
2. Correctly insert 2 AAA alkali batteries matching + and - polarities with indications.
3. Push SET button with something tipped and attach the cover.




## Cautions for installation of the remote controller

- To operate the remote controller by fixing it to the wall, etc. with a remote controller holder, turn on the fluorescent lamp, operate the remote controller at the position to be fixed, check the air conditioner normally operates, and then mount it.
- When the room temperature is sensed by the remote controller, mount the remote controller paying attention to the following items.
  - Place not exposed directly to cold or hot wind.
  - Place not exposed directly to the sunlight.
  - Other places where the remote controller is not influenced.

## Explanation to customers

- Hand over the "Owner's Manual" and "Installation Manuals" to the customer after installation works.
- Explain usage and maintenance of the remote controller according to "Owner's Manual".



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